



Arlington Conservation Commission

Date: Thursday, May 2, 2024

Time: 7:00 PM

Location: Conducted by Remote Participation.

Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page. This meeting will be conducted in a remote format consistent with Chapter 2 of the Acts of 2023, which further extends certain COVID-19 measures regarding remote participation in public meetings until March 31, 2025. Please note: Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law. This agenda includes those matters which can be reasonably anticipated to be discussed at the meeting.

Agenda

1. Administrative
 - a. Review Meeting Minutes.
 - b. Correspondence Received.
All correspondence is available to the public. For a full list, contact the Conservation Agent at concomm@town.arlington.ma.us.
 - c. Administrative Report.
2. Discussion
 - a. Tree Committee Update.
 - b. 66-66R Dudley Street Enforcement.
 - c. 34 Dudley Street Enforcement.

3. Hearings

Request for Amendment to DEP #091-0323: Order of Conditions: 869 Massachusetts Avenue (Arlington High School).

Request for Amendment to DEP #091-0323: Order of Conditions: 869 Massachusetts Avenue (Arlington High School).

This public hearing will consider an amendment to the Order of Conditions for construction of a new high school building and appurtenances at 869 Massachusetts Avenue within the Riverfront Area, Adjacent Upland Resource Area, and Buffer Zone to Mill Brook.

DEP #091-0323: Extension of Order of Conditions: 869 Massachusetts Avenue (Arlington High School) (Continued from 4/18/2024).

DEP #091-0323: Extension of Order of Conditions: 869 Massachusetts Avenue (Arlington High School) (Continued from 4/18/2024).

This public hearing will consider an extension of the Order of Conditions for construction of a new high school building and appurtenances at 869 Massachusetts Avenue within the Riverfront Area, Adjacent Upland Resource Area, and Buffer Zone to Mill Brook.

DEP #091-0278: Amendment to Order of Conditions: 88 Coolidge Road (Continued from 4/18/2024).

DEP #091-0278: Amendment to Order of Conditions: 88 Coolidge Road (Continued from 4/18/2024).

This public hearing will consider the peer review report for an amendment to an Order of Conditions for construction of a new house at 88 Coolidge Road in the Buffer Zone to a Bordering Vegetated Wetland.

DEP #091-0356: Notice of Intent: Thorndike Place (Continued from 4/18/2024).

DEP #091-0356: Notice of Intent: Thorndike Place (Continued from 4/18/2024).

The Conservation Commission will hold a public hearing under the Wetlands Protection Act to consider a Notice of Intent for the construction of Thorndike Place, a multifamily development on Dorothy Road in Arlington.



Town of Arlington, Massachusetts

Correspondence Received.

Summary:

Correspondence Received.

All correspondence is available to the public. For a full list, contact the Conservation Agent at concomm@town.arlington.ma.us.

ATTACHMENTS:

Type	File Name	Description
Reference Material	Correspondence_Received_-_Arlington_High_School_-_Nathaniel_Stevens_-_WHC_final_SOC.pdf	Correspondence Received - Arlington High School - Nathaniel Stevens - WHC final SOC.pdf
Reference Material	Correspondence_Received_-_Arlington_High_School_-_Susan_Chapnick_-_6PPD-q_Analysis.pdf	Correspondence Received - Arlington High School - Susan Chapnick - 6PPD-q Analysis.pdf
Reference Material	Correspondence_Received_-_Arlington_High_School_-_Susan_Chapnick_-_6PPD-q_Fact_Sheet.pdf	Correspondence Received - Arlington High School - Susan Chapnick - 6PPD-q Fact Sheet.pdf
Reference Material	Correspondence_Received_-_Beth_Melofchik_-_EPA_Webinar.pdf	Correspondence Received - Beth Melofchik - EPA Webinar.pdf
Reference Material	Correspondence_Received_-_Beth_Melofchik_-_PFAS.pdf	Correspondence Received - Beth Melofchik - PFAS.pdf
Reference Material	Correspondence_Received_-_Beth_Melofchik_-_PFAS_2.pdf	Correspondence Received - Beth Melofchik - PFAS 2.pdf
Reference Material	Correspondence_Received_-_Beth_Melofchik.pdf	Correspondence Received - Beth Melofchik.pdf
Reference Material	Correspondence_Received_-_Brad_Barber_-_Spy_Pond_Trails_Day.pdf	Correspondence Received - Brad Barber - Spy Pond Trails Day.pdf
Reference Material	Correspondence_Received_-_Daniel_Harple.pdf	Correspondence Received - Daniel Harple.pdf
Reference Material	Correspondence_Received_-_David_White_-_AGM.pdf	Correspondence Received - David White - AGM.pdf
Reference Material	Correspondence_Received_-_David_White_-_Mt._Gillboa.pdf	Correspondence Received - David White - Mt. Gillboa.pdf
Reference Material	Correspondence_Received_-_DCR_-_Upper_Mystic_Lake_Dam.pdf	Correspondence Received - DCR - Upper Mystic Lake Dam.pdf
Reference Material	Correspondence_Received_-_Jacob_Evans.pdf	Correspondence Received - Jacob Evans.pdf
Reference Material	Correspondence_Received_-_Jude_Marcotte.pdf	Correspondence Received - Jude Marcotte.pdf
Reference Material	Correspondence_Received_-_Kirsty_Bennett.pdf	Correspondence Received - Kirsty Bennett.pdf
Reference Material	Correspondence_Received_-_Sue_Doctrow_-_Mt._Gillboa.pdf	Correspondence Received - Sue Doctrow - Mt. Gillboa.pdf

Reference Material	Correspondence_Received_-_Susan_Chapnick_-_BOH_Artifical_Turf_Ban.pdf	Correspondence Received - Susan Chapnick - BOH Artifical Turf Ban.pdf
Reference Material	Correspondence_Received_-_Thorndike_Place_-_Coalition_to_Save_the_Mugar_Wetlands.docx	Correspondence Received - Thorndike Place - Coalition to Save the Mugar Wetlands.docx
Reference Material	Correspondence_REceived_-_Thorndike_Place_-_Lisa_Fredman_-_Health_Impact_Letter.pdf	Correspondence REceived - Thorndike Place - Lisa Fredman - Health Impact Letter.pdf
Reference Material	Correspondence_Received_-_Thorndike_Place_-_Scott_Oran_-_ALT_Data.pdf	Correspondence Received - Thorndike Place - Scott Oran - ALT Data.pdf
Reference Material	Correspondence_Received_-_Tim_Lecuivre_-_34_Dudley_Street_Tree_Bylaw_Violation_Letter.pdf	Correspondence Received - Tim Lecuivre - 34 Dudley Street Tree Bylaw Violation Letter.pdf
Reference Material	Correspondence_Received_-_Wolfgang_Kirstein_-_Thorndike_Place_Test_Pit_Notes____Locations.pdf	Correspondence Received - Wolfgang Kirstein - Thorndike Place Test Pit Notes & Locations.pdf
Reference Material	Correspondence_Received_-_Thorndike_Place_-_MMA_Mounding_Analysis_Letter_4-26-24.pdf	Correspondence Received - Thorndike Place - MMA Mounding Analysis Letter 4-26-24.pdf
Reference Material	Correspondence_Received_-_Thorndike_Place_Test_Pit_Notes____Locations_-_Town_of_Arlington_-_2024.04.17.pdf	Correspondence Received - Thorndike Place Test Pit Notes & Locations - Town of Arlington - 2024.04.17.pdf
Reference Material	Correspondence_Received_-_Clarissa_Rowe_-_Thorndike_Place_-_W_S_ClimateResiliencyMemo_20210122.pdf	Correspondence Received - Clarissa Rowe - Thorndike Place - W&S ClimateResiliencyMemo_20210122.pdf
Reference Material	Correspondence_Received_-_Clarissa_Rowe_-_Thorndike_Place_-_W_S_for_ALT_2020.12.22_Talking_Points.docx	Correspondence Received - Clarissa Rowe - Thorndike Place - W&S for ALT 2020.12.22 Talking Points.docx
Reference Material	Correspondence_Received_-_Clarissa_Rowe_-_Thorndike_Place_-_W_S_Memo_for_ALT_1-19-21.pdf	Correspondence Received - Clarissa Rowe - Thorndike Place - W&S Memo for ALT 1-19-21.pdf



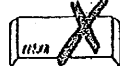
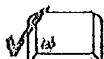
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Final Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

344-1233

A. General Information

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Northeast Regional Office
Regional Office of the Department of Environmental Protection (MassDEP)
2. This issuance is for (check one): a. ☒ Final Order of Conditions b. ☐ Amended Final OOC

3. To: Applicant:

Michael Calra
a. First Name b. Last Name
Town of Wilmington
c. Organization
121 Glen Road
d. Mailing Address
Wilmington MA 01887
e. City/Town f. State g. Zip Code

4. Property Owner (if different from applicant):

a. First Name b. Last Name

c. Organization

d. Mailing Address

e. City/Town f. State g. Zip Code

5. Project Location:

159 Church Street Wilmington
a. Street Address b. City/Town
63/ some of 26, 60, 61, 103, R1 3A, 3B, 3C, 10/ some of 9, 17, 6, 10, 3
c. Assessor's Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known:
e. Latitude f. Longitude

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Middlesex North
a. County b. Certificate Number (if registered land)
159 Church: 989/9369/9438 384/14/229
c. Book d. Page

7. Dates: April 11, 2012 May 9, 2012 May 11, 2012
a. Date Notice of Intent Filed b. Date Public Hearing Closed c. Date of OOC Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

"Wilmington High School, 159 Church Street, Wilmington, MA, Notice of Intent" Sheets C-0.00 to C-6.03, WL-1.0 to WL-4.0, CT-1 to CT-5, EX R1 and PR R1

Nilsch Engineering Sandra Brock, P.E. No. 39417
b. Prepared By c. Signed and Stamped by
June 21, 2012 variable
d. Final Revision Date e. Scale

See attached Special Conditions
f. Additional Plan or Document Title g. Date



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B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act. Check all that apply:

- a. ☒ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution
d. ☒ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

- a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

Denied because:

- b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect these interests, and a final Order of Conditions is issued. A description of the performance standards which the proposed work cannot meet is attached to this Order.
- c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and wetland boundary (if available)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input checked="" type="checkbox"/> Bank	24 a. linear feet	24 b. linear feet	24 c. linear feet	24 d. linear feet
5. <input checked="" type="checkbox"/> Bordering Vegetated Wetland	160 a. square feet	160 b. square feet	160 c. square feet	160 d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	 a. square feet	 b. square feet	 c. square feet	 d. square feet
	 e. c/y dredged	 f. c/y dredged		



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B. Findings (cont.)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input checked="" type="checkbox"/> Riverfront area	34,320	34,320		
a. total sq. feet	9,220	9,220	19,300	19,300
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
25,100	25,100	30,034	30,034	
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

10. ☐ Designated Port Areas Indicate size under Land Under the Ocean, below
11. ☐ Land Under the Ocean a. square feet b. square feet
c. c/y dredged d. c/y dredged
12. ☐ Barrier Beaches Indicate size under Coastal Beaches and/or Coastal Dunes below
13. ☐ Coastal Beaches a. square feet b. square feet c. c/y nourishmt. d. c/y nourishmt.
14. ☐ Coastal Dunes a. square feet b. square feet c. c/y nourishmt. d. c/y nourishmt.
15. ☐ Coastal Banks a. linear feet b. linear feet
16. ☐ Rocky Intertidal Shores a. square feet b. square feet
17. ☐ Salt Marshes a. square feet b. square feet c. square feet d. square feet
18. ☐ Land Under Salt Ponds a. square feet b. square feet
c. c/y dredged d. c/y dredged
19. ☐ Land Containing Shellfish a. square feet b. square feet c. square feet d. square feet
20. ☐ Fish Runs Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or Inland Land Under Waterbodies and Waterways, above
a. c/y dredged b. c/y dredged
21. ☐ Land Subject to Coastal Storm Flowage a. square feet b. square feet



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C. General Conditions Under Massachusetts Wetlands Protection Act

(only applicable to approved projects)

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - a. the work is a maintenance dredging project as provided for in the Act; or
 - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
7. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before MassDEP have been completed.
8. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording Information shall be submitted to MassDEP on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 344-1233 "



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C. General Conditions Under Massachusetts Wetlands Protection Act

10. Where the MassDEP is requested to Issue a Final Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
11. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to MassDEP.
12. The work shall conform to the plans and special conditions referenced in this order.
13. Any change to the plans identified in Condition #12 above shall require the applicant to inquire of MassDEP in writing whether the change is significant enough to require the filing of a new Notice of Intent.
14. The Agent or members of the Conservation Commission and MassDEP shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or MassDEP for that evaluation.
15. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
16. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by MassDEP.
17. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify MassDEP, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

18. The work associated with this Order (the "Project") is (1) ☒ is not (2) ☐ subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:
 - a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
- all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
 - as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
 - any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
 - all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
 - any vegetation associated with post-construction BMPs is suitably established to withstand erosion.
- c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMPs Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.
- d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.
- e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, and acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.
- f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
- h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
- i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
- j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
- k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
- l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

☒ SOC Special Conditions (see the attached sheet(s) for additional conditions numbered 19 thru 57.

☐ **AFFIRMATION** See the attached Order of Conditions containing Special conditions with all plan references and/or other attachments issued by the Revere Conservation Commission on which is hereby affirmed and made part of this decision, as modified by the following special conditions:

FINAL ORDER OF CONDITIONS
DEP File Number 344-1233

Special Conditions

19. All work shall conform with the following plans, reports and special conditions:
- 1) "Wilmington High School, 159 Church Street, Wilmington, MA, Notice of Intent", Sheets C-0.00 to C-6.03, WL-1.0 to WL-4.0, CT-1 to CT-5, EX R1 and PR R1
 - 2) "Long-Term Pollution Prevention Plan & Stormwater Operation and Maintenance Plan, Wilmington High School" Pages 1 - 11 prepared by Nitsch Engineering, Final Revision date: July 2, 2012.
 - 3) "Offsite Mitigation Planting Plan, Notes, Details and Planting Schedule, Wilmington, MA" prepared by Nitsch Engineering, dated April 30, 2012.
20. This Final Order supersedes all previous Orders issued for this project, DEP File #344-1233. All work shall conform to the Notice of Intent and plans and documentation referenced above unless otherwise specified in this Final Order. In case of a conflict, the Conditions of this Final Order shall prevail.
21. A copy of this Final Order shall be included in all construction contracts and shall supersede any conflicting requirements.
22. A copy of this Final Order as well as the plans and reports referenced in Condition #20 shall be available on site while activities regulated by this Order are being performed. In addition to the owners, all contractors and subcontractors shall be held responsible for compliance with this Final Order.
23. No work shall commence on-site until all appeal periods have elapsed and this Final Order of Conditions has been recorded with the Registry of Deeds and the MassDEP has been formally notified via the form provided at the end of this Order.
24. This Final Order shall apply to any successor or assigns in interest or control and any other party engaging in activity on the property identified in the Notice of Intent.
25. Any proposed or executed change in the plans approved under this Final Order shall require the applicant to file a new Notice of Intent with the conservation commission or to inquire of the MassDEP in writing whether the change is substantial enough to require a new filing. A copy shall be sent at the same time to the Wilmington Conservation Commission. Any errors in the plans or information submitted by the applicant shall be considered changes and the above procedures shall be followed.
26. Members and agents of the MassDEP and the Wilmington Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions contained in this Final Order, and may require the submittal of any data deemed necessary by the MassDEP for that evaluation.
27. The applicant shall employ an Environmental Monitor (EM) and a wetland scientist to oversee all work within the 100-foot buffer zone, Bank, Bordering Vegetated Wetland, Riverfront Area on the project site, including but not limited to supervision of the maintenance and replacement of all erosion controls and temporary storm water structures. The Environmental Monitor shall be responsible for ensuring compliance with this SOC during construction. The applicant shall provide the MassDEP and the Wilmington Conservation

Commission with the name(s), address(es) and telephone number(s) of the Environmental Monitor and his or her alternate prior to the start of work.

28. The Environmental Monitor shall inspect erosion controls on a weekly basis and after any storm events and shall have the authority to modify existing controls or require additional controls if he or she deems it necessary. The Environmental Monitor shall immediately control any erosion problems that occur on the site and shall immediately notify MassDEP and the Wilmington Conservation Commission if any discharges to a wetland resource area occur. MassDEP reserves the right to require additional erosion control and/or damage prevention controls it may deem necessary.

29. The Environmental Monitor shall report in writing to MassDEP and the Wilmington Conservation Commission once every month while construction is underway within the 100-foot buffer zone or any wetland resource area to confirm that all activities are in compliance with the conditions of this SOC. The status report shall at a minimum include a description of any erosion control problems, progress on construction and grading, changes in construction schedule, actions taken to address problems and any other recommendations for site management.

30. Prior to the commencement of any activity on the site, there shall be a pre-construction meeting between the project supervisor, the contractor responsible for the work, the Environmental Monitor, a representative of the Wilmington Conservation Commission and a representative of MassDEP to ensure that the requirements of the SOC are understood. Arrangements for the meeting shall be made at least two (2) weeks prior to any activity.

31. Prior to the start of work, the applicant shall submit a construction sequence to MassDEP and the Wilmington Conservation Commission, for approval by MassDEP. The construction sequence shall address the construction of the wetland restoration areas, on and off-site Riverfront Area mitigation and storm water facilities, including but not limited to the installation of interim or permanent storm water controls such as sediment basins. The construction sequence shall include a plan showing the location of soil and material stockpile areas and shall also indicate the method by which storm water infiltration areas will be protected from contamination during construction. Work shall not commence until MassDEP has approved the construction sequence.

32. Prior to the start of work, erosion controls consisting of silt fence and staked haybales shall be installed between the limits of work and the wetland. These barriers shall serve as the limit of disturbance and shall be installed as close to the work area as possible.

33. There shall be no vehicles, machinery or activities within the wetland, except as required to construct the wetland restoration areas and Riverfront mitigation areas. Any debris that falls or blows into the wetland shall be removed immediately by hand.

34. The pipes associated with the infiltration basins and detention basins shall be equipped with emergency shut-off valves. Permanent signage shall be installed to direct residents and/or maintenance staff in on shut-off procedures in case of an accidental spill.

35. Upon completion of the project and full stabilization of all disturbed surfaces, all sedimentation barriers shall be removed from the site. Soil surfaces which are disturbed by the erosion controls shall be raked smooth by hand (if needed) and seeded with an appropriate seed mix.

36. No soil or other materials shall be stockpiled within 100 feet of wetlands.

37. Upon completion of construction, all exposed soils shall be seeded with appropriate vegetation or otherwise stabilized by a method acceptable to the MassDEP and Wilmington Conservation Commission.
38. At no time during or after construction shall fill or other materials be placed, slump into or fall beyond the limit of grading as shown on the plan. The Environmental Monitor shall be responsible for inspecting and maintaining all slopes and shall immediately notify the MassDEP and the Wilmington Conservation Commission if slumping, erosion or encroachment occurs.
39. Excess soil, rock and debris excavated or generated during the course of this project shall be removed from the site and disposed of in a legal manner. Records as to the destination of all materials, including excess fill and loam, to be removed from the site shall be kept on file and shall be provided to the MassDEP and the Wilmington Conservation Commission upon request.
40. Storing, servicing or cleaning of equipment, including but not limited to fueling, changing, adding or applying lubricants or hydraulic fluids, or washing/rinsing of trucks or equipment, shall be performed outside the 100-foot buffer zone.
41. During work on this project, there shall be no discharge or spillage of fuel, oil or other pollutants, including sediments, onto any part of the site. The applicant shall take all reasonable precautions to prevent the release of pollutants by ignorance, accident or vandalism.
42. During construction, all paved roadways shall be swept monthly with a vacuum sweeper, except when they are covered with snow or ice.
43. All stormwater structures shall be managed and maintained in accordance with the project's Operation and Maintenance Plan (dated July 2, 2012) and the conditions contained in this Final Order. This Condition shall remain in effect in perpetuity and shall be recorded on the Certificate of Compliance.
44. Riverfront Area mitigation areas located at Wildwood School (removal of pedestrian walk within the Riverfront Area – 14,562 sq.ft); Town Park (removal of parking lot and other degraded areas within the Riverfront Area – 11,292 sq.ft); and Nathan Road (removal of degraded and altered areas within the Riverfront Area – 2,000 sq.ft), shall be constructed during the Spring of 2013 but no later than June 2013. The on-site mitigation area shall be constructed by the Fall of 2014 but no later than November 1, 2014. Prior to the start of work, the applicant shall submit a construction sequence plan to MassDEP and the Wilmington High School for review and approval. Work shall not commence until MassDEP has approved the construction sequence.
45. A wetland scientist shall oversee the on-site and off-site Riverfront Area restoration work, monitor the restoration areas after completion of restoration, and provide weekly reports to the MassDEP and Wilmington Conservation Commission during restoration work and throughout the monitoring period. The wetland scientist shall perform weekly observations during the restoration work at each of the sites, including the following:
- a) Observation of the bottom of the degraded areas after removal of pavement section or gravel to confirm the appropriate depth of material has been removed.
 - b) Observation of the final grading of loam prior to planting to confirm general compliance to proposed restoration plans.
 - c) Observation of planting layout prior to planting to adjust the planting locations as needed in the field.
 - d) The wetland scientist shall review the plan for loam/planting soil prior to placement of loam/planting soils.
 - e) The wetland scientist shall inspect the plant materials prior to planting. In the event changes to the planting plan are determined to be warranted, the wetland scientist shall notify the MassDEP and

Wilmington Conservation Commission. All plantings will occur following snow-melt in the spring, but no later than June 1, 2013.

46. A wetland scientist shall conduct monitoring of all Riverfront Area restoration areas. The following protocol shall be performed:

- a) Perform a minimum of one site visit during the two growing seasons and prepare a field report for each visit, and send a copy of the field report to the MassDEP and Wilmington Conservation Commission. If there are issues with erosion, plant material dying, etc. the wetland scientist shall notify the MassDEP and Wilmington Conservation Commission and provide a plan to rectify the situation.
- b) Perform a minimum of two site visits during the summer, prepare a field report for each visit, and send a copy of the field report to the MassDEP and Wilmington Conservation Commission. If there are issues with erosion, plant material dying, etc. the wetland scientist shall notify the MassDEP and Wilmington Conservation Commission and provide a plan to rectify the situation.
- c) The mitigation sites shall be monitored for invasive species. If found these shall be removed by hand as soon as possible.
- d) The wetland scientist shall prepare a final report at the end of two growing seasons and determine if at least 75% of the surface of restoration areas has been reestablished with indigenous plant species. A copy of this final report shall be submitted to the MassDEP and Wilmington Conservation Commission. If any of the areas have not established at least a 75% restoration, then the wetland scientist shall provide MassDEP and the Wilmington Conservation Commission with a plan to reestablish the plant community and include a new monitoring schedule to ensure success of the area.

47. Prior to the commencement of any work within or around the AUL, the Licensed Site Professional (LSP) of Record shall submit an Opinion to MassDEP and the Wilmington Conservation Commission. If, based upon facts provided in the Opinion, changes to the project are required, these proposed changes to the project shall be submitted to MassDEP and the Wilmington Conservation Commission for review and approval. Work within the AUL area shall be overseen by a LSP. If other contaminated areas are found on site, MassDEP and the Wilmington Conservation Commission shall be notified within 48 hours. Any such areas shall be handled in accordance with MassDEP regulations.

48. Prior to work on the artificial turf field, the applicant shall submit a protocol for testing outflow from the under field drainage system to MassDEP and the Wilmington Conservation Commission for review and approval. The protocol shall require sampling, coincident with a significant rain event (greater than .25 inches), prior to construction for the purpose of determining a baseline, and on a monthly basis for the first year following installation of the field. The protocol shall require the measurement of concentrations of at least the following analytes: arsenic, barium, cadmium, chromium, lead, mercury, and zinc. If any analytes in the post installation sample exceed MA DEP GW-3 standards, the applicant shall notify MassDEP and the Wilmington Conservation Commission within 24 hours of receipt of the report shall immediately institute emergency shut-down of the system and submit a plan to MassDEP and the Wilmington Conservation Commission for the prompt mitigation of the excessive concentrations of those analytes. If, after six months of sampling, the result support a reduced sampling frequency, MassDEP and the Wilmington Conservation Commission may allow, upon written request from the Applicant with supporting information, that sampling frequency be reduced to quarterly. After the first year, the Applicant may reduce sampling frequency to quarterly, with at least three rounds collected during the playing season, April through November for the life of the field. After a total of 5 years of monitoring, MassDEP and the Wilmington Conservation Commission may allow reduced sampling frequency, upon written request from the Applicant with supporting information, however, at a minimum sampling must occur annually from there on for the life of the fields.

49. In the event that sampling results exceed national Ambient Water Quality Criteria or MCP GW-3 at any time, the Applicant shall evaluate response actions with a goal of restoring background levels. Such actions

could include replacing the infill material with an alternative infill or replacement of the artificial turf field with natural turf. Such response actions shall be submitted to MassDEP and the Wilmington Conservation Commission for review and approval in the form of a Notice of Intent, if required by MassDEP and the Wilmington Conservation Commission, within 60 days of the exceedance. This condition shall remain in perpetuity.

50. The Applicant shall submit for review and approval a protocol and plan for monitoring any migration of infill material from the synthetic turf field within the buffer zone and Riverfront Area. Such a protocol should include at least three transects from the edge of the field towards the wetlands with proposed sampling locations. At these locations, soil samples should be sieved and then crumbs point counted. Monitoring shall be done annually to determine if the styrene-butadiene rubber ("SBR") does migrate from the site towards or into the wetland. Additional sampling points shall be added in the event SBR crumbs are detected at the farthest sampling point from the field until SBR is detected. Monitoring for SBR crumbs may be suspended after three years with the approval of MassDEP and the Wilmington Conservation Commission upon written request from the Applicant documenting that there has been no SBR migration from the field.

51. Removal of the 30-inch and 12-inch drainage pipes will result in temporary impacts to Bordering Vegetated Wetlands (BVW) and Bank. All activities involving preparation and construction of the BVW and Bank restoration areas, including but not limited to: inspecting and confirming flagging prior to and after excavation of the BVW; identifying appropriate organic soils to be placed in the restoration areas; overseeing final grading of the areas; inspecting final elevations and confirming ground water elevations; obtaining planting and maintaining the specified wetland plants; monitoring and reporting on the restoration areas shall be overseen by a wetland scientist who will be on-site while the work is being performed. The wetland scientist shall submit written status report to MassDEP and the Wilmington Conservation Commission at the following times:

- a) at the start of excavation of the replication and restoration areas;
- b) when final grades are established;
- c) when the planting is completed;
- d) one month after planting has been completed;
- e) at the beginning and end of the growing season each year for at least two years after the replication area has been planted.

52. The wetland restoration areas shall be brought to final grade using organic soils and prepared for planting. If manufactured organic soils are used, they shall consist of soils which contain at least twenty (20) percent peat or partially decomposed leaf litter and shall have approximately the same pH, texture and fertility as the native wetland soil. The wetland restoration areas shall have a base of at least twelve (12) inches of organic soil prior to planting.

53. Planting of the restoration areas with the species described in the planting plan shall proceed immediately upon final grading, weather permitting. If seasonal conditions prevent planting, the replication/restoration areas shall be planted as soon as weather permits. Any plants that die shall be replaced.

54. A wetland professional shall submit a status report on the wetland restoration areas at the end of each growing season, and no later than September 1 of each year, for two (2) years after planting is completed. The report shall include a description of the relative health of the planted species and shall make recommendations for replacement of plants if needed. At least 75 percent of the replication and restoration areas shall be reestablished with wetland plant species within two growing seasons. A Certificate of Compliance will not be issued until this condition has been met.

55. Prior to the installation of the infiltration systems, test pits shall be done in accordance with specification in the MassDEP Stormwater Handbook. A copy of the test pit logs shall be submitted to MassDEP and the

Wilmington Conservation Commission. Any changes to the project which are required as a result of the test pits shall be submitted to MassDEP and the Wilmington Conservation Commission. MassDEP will determine, at that time, whether the work proposed will require an Amended Final Order of Conditions or new Notice of Intent.

56. Only rubber from car tires is permitted as infill in the synthetic turf field. The Applicant shall provide a copy of the certification from the manufacturer that the infill consists only from car tires. This condition shall extend to any infill added at later dates for field maintenance, and shall be an ongoing condition.

57. Upon completion of the project, the applicant shall request a Certificate of Compliance from the MassDEP and shall submit the following information with the request:

a) A written statement by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts certifying compliance with the approved plans referenced above and this Final Order of Conditions and setting forth deviations, if any exist;

b) An as-built site plan prepared by a registered land surveyor or registered professional engineer showing location and grades of the project, including but not limited to: buildings, parking lots, driveways, landscaping, detention basins, infiltration basins, site grading, retaining walls, sidewalks and drainage structures within the 100-foot Buffer Zone.

c) An as-built plan of the wetland restoration areas and on and off-site Riverfront Area mitigation areas shall be submitted to MassDEP. This plan shall include the date(s) of field work and at least three photographs of each area. The plan shall be accompanied by a report by a wetlands scientist describing the condition of the wetland restoration areas and Riverfront Area mitigation sites, including the number and relative health of the plantings.

D. Findings Under Municipal Wetlands Bylaw or Ordinance

To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, MassDEP has no jurisdiction to supersede the local bylaw order.

E. Issuance

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

November 15, 2012
1.) Date of Issuance

The Final Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Conservation Commission, appellant and the property owner, if different from the applicant.

Issued by the Massachusetts Department of Environmental Protection:

Signature:


Kenneth L. Kinnell, Commissioner

Date

November 15, 2012

This Order is issued to the applicant as follows:

☐ by hand delivery on

☒ by certified mail, return receipt requested, on

Date

11/15/12 #70033110 0001 6100 2724
Date

F. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to MassDEP listed below.

Regional Office of the Massachusetts Department of Environmental Protection

Detach on dotted line, have stamped by the Registry of Deeds and submit to MassDEP.

To:

Regional Office of the Department of Environmental Protection

Please be advised that the Order of Conditions for the Project at:

159 Church Street, Wilmington, MA
Project Location

344-1233
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Middlesex North
County

Book

Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

Fwd: RE: 6PPD-quinone analysis info

Susan D. Chapnick <s.chapnick@comcast.net>

Mon 4/29/2024 12:48 PM

To:David Morgan <dmorgan@town.arlington.ma.us>;Chuck Tirone <ctirone@ci.reading.ma.us>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

David,

I have received the following email from Eurofins, which is the analytical lab that worked with EPA on the Draft Method 1634 for analysis of 6PPD-quinone.

Please forward this communication to the AHSBC applicant and include it as correspondence for the hearing this Thursday.

Thank you.

Susan

Susan D. Chapnick, M.S.

Vice Chair, Arlington Conservation Commission

s.chapnick@comcast.net

----- Original Message -----

From: Nicholas Corso <Nicholas.Corso@et.eurofinsus.com>

To: "Susan D. Chapnick" <s.chapnick@comcast.net>

Date: 04/26/2024 5:02 PM EDT

Subject: RE: 6PPD-quinone analysis info

Hi Susan,

Here are the 6-PPD-Q details:

Method: 6-PPD-Q is analyzed via LC/MS/MS utilizing isotope dilution for quantification. As you may know, we developed EPA Draft Method 1634 with the EPA. We are in progress of aligning our SOP with the Draft Method 1634.

Sensitivity: Water RL @ 2 ng/L, Solid RL @ 0.25 ng/g

Holding Time: From our current SOP, Table 8

Table 8

Sample Collection, Preservation, and Storage Requirements

Matrix	Sample Container	Minimum Sample Size	Preservation	Holding Time ¹
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Aqueous	250 mL amber glass bottle	250 mL	0-6°C	7 days (we will be changing this to 14 days, Method 1634)
Solid	4 oz. glass jar	100 g	0-6°C	14 days

Extraction holding time is calculated from date of collection. Analytical holding time is determined from date of extraction.

Extracts must be stored at 0 - 6°C and analyzed within 28 days after extraction.

The following is from Draft method 1634

Aqueous samples that flow freely are collected as grab samples that are free of headspace or in refrigerated bottles using automatic sampling equipment. Collect aqueous samples in 250-mL amber glass jars with PTFE-lined caps.

8.2 Protect aqueous samples from light (in amber glass containers) at less than or equal to 6 °C (but keep from freezing) from the time of collection until sample preparation at the laboratory.

Standard TAT: 15 -20 BD

Pricing:

- Water @ \$500 (note: I might be able to get this down to around \$450 for you)
- Solid @ \$515

Let me know if you need anything else.

Nick

From: Susan D. Chapnick <s.chapnick@comcast.net>

Sent: Friday, April 26, 2024 1:14 PM
To: Nicholas Corso <Nicholas.Corso@et.eurofinsus.com>
Subject: 6PPD-quinone analysis info

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Nick!

I was hoping you could send me some information on Eurofins capabilities, detection limit, and cost to perform 6PPD-quinone analysis using EPA Draft Method 1634 on aqueous samples that may be planned to be collected from the outflow of a stormwater drainage system underlying an artificial turf field with tire crumb rubber infill.

We are having a hearing on an amendment to the permit for the Arlington High School artificial turf field that is within the wetland jurisdiction of Mill Brook on May 2nd - so if you can get me this information prior to that meeting, I would really appreciate it.

Hope you are enjoying the spring weather!

Best,

Susan

Susan D. Chapnick, M.S.

Vice Chair, Arlington Conservation Commission

s.chapnick@comcast.net

President & Principal Scientist

NEH, Inc.

2 Farmers Cir

Arlington, MA 02474

What We Know: 6PPD and 6PPD-quinone

In the short time since 6PPD-quinone (6PPD-q) was isolated and characterized, scientists have been working to understand its prevalence and behaviors in the environment. This focus sheet provides environmental officials with a brief overview of the current understanding of 6PPD-q sources, exposure, fate, transport, toxicity, and mitigation strategies. In-depth ITRC guidance will be released in summer 2024.

In 2020, researchers in Washington State discovered and identified 6PPD-quinone (6PPD-q) as the stormwater chemical responsible for urban runoff mortality syndrome observed in coho salmon (*Oncorhynchus kisutch*) around Puget Sound over the last 25 years.^{1,2} Research has demonstrated that 6PPD-q is also acutely lethal to brook trout³ and rainbow trout/steelhead.³⁻⁵ 6PPD is the primary anti-degradant in tires and has been in use since the 1960s. 6PPD-q is one of

the products formed by the reaction of 6PPD and ozone (Figure 1). 6PPD-q may be present in many places impacted by tire use. 6PPD and 6PPD-q have been detected in stormwater and surface waters on many continents^{1,6-10} and have been found in airborne particulates,¹¹⁻¹⁴ sediment,¹⁵ soil,¹¹ rubber products other than tires,¹⁶ and human urine.¹⁷

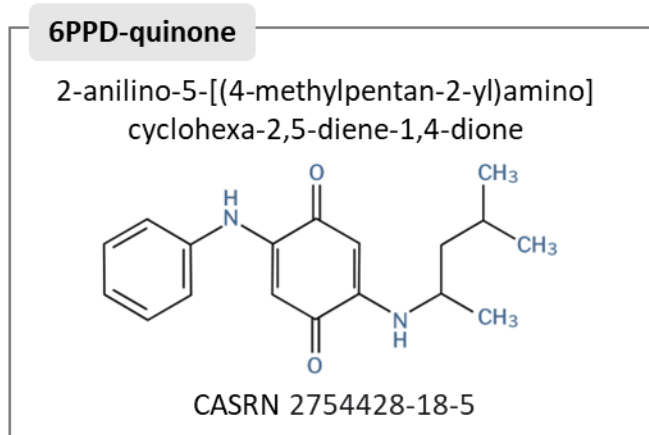
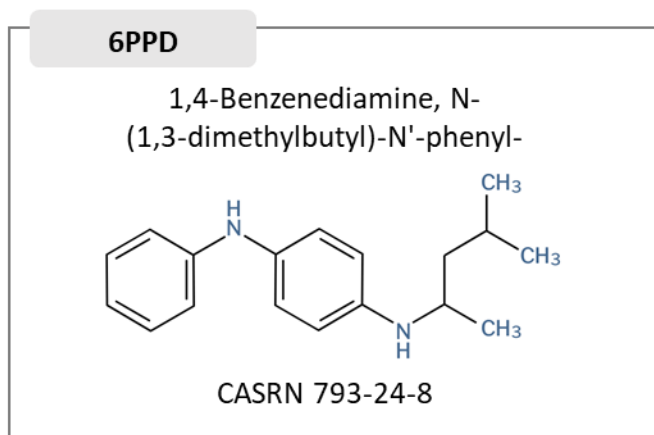


Figure 1. Chemical structures for 6PPD and 6PPD-quinone.

How Is 6PPD-q Entering Surface Waters?

Tire wear particles (TWPs) containing 6PPD-q are transported via stormwater to surface water (Figure 2). Many urban stormwater systems are designed to control flooding, not capture and treat contaminants. In separate storm sewer systems, rainwater is transported to natural receiving waters through a network of ditches and pipes without natural or engineered green

spaces to remove pollutants prior to entering surface waters. Additionally, some areas with installed stormwater best management practices (BMPs) are failing to contain stormwater due to increased urbanization and storm events that are larger than the infrastructure was designed for, leading to direct conveyance of 6PPD-q to vulnerable aquatic ecosystems.

What We Know: 6PPD and 6PPD-quinone

Multiple aspects of the lifecycle of 6PPD-q are under investigation. This includes the factors that influence the formation of 6PPD-q in tires and tire wear particles (TWPs) in the environment, 6PPD-q's leaching rates from TWPs, and its persistence and bioaccumulation potential. Programs that

divert scrap tires from landfills recycle the tires into crumb rubber materials used on sports fields, rubber-modified asphalt, tire-derived aggregate used in civil engineering projects, and more. The levels of 6PPD-q released from recycled tire products is also actively being researched.

Conceptual Transport and Exposure Model

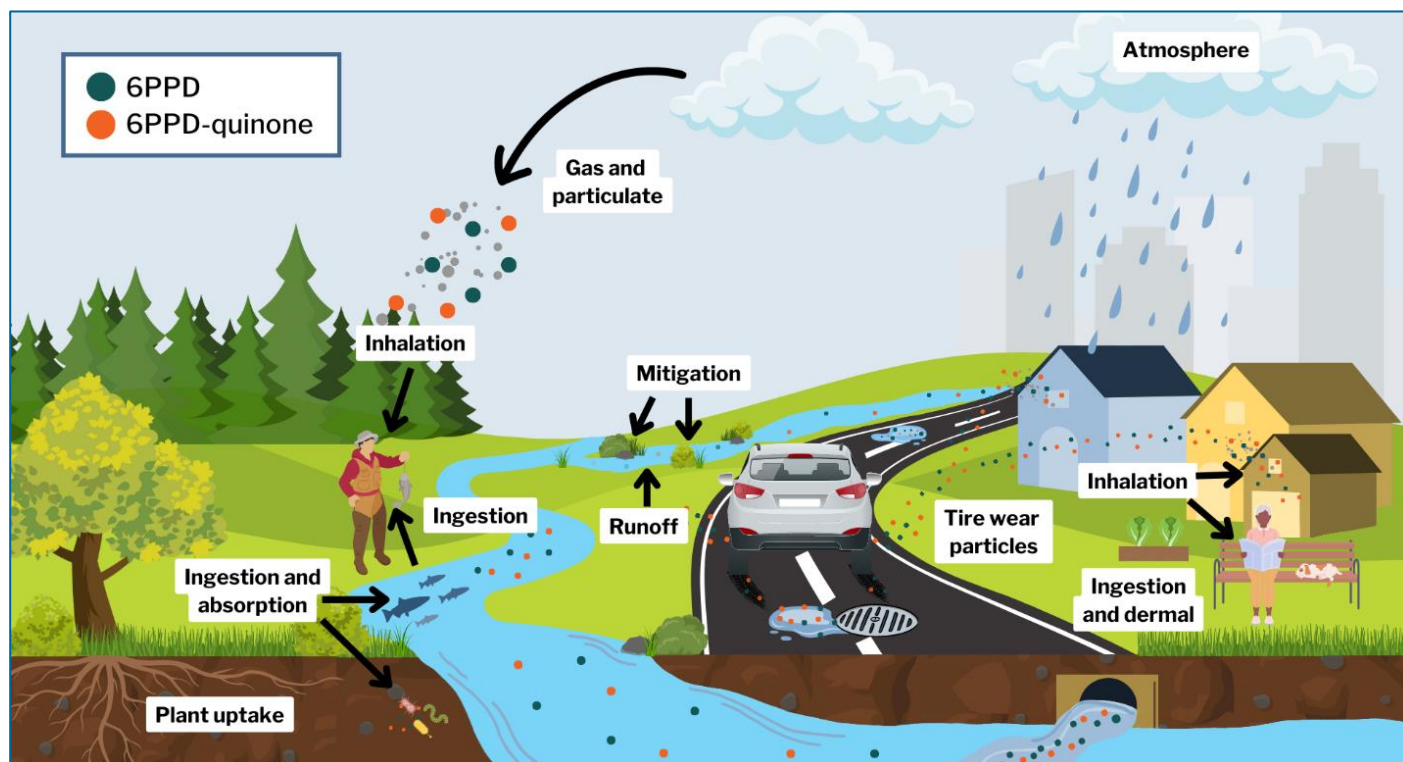


Figure 2. 6PPD in tires is converted to 6PPD-quinone (6PPD-q) when exposed to ozone. 6PPD-q is contained in tire wear particles that can be transported in the air and potentially inhaled by people. The particles can also be deposited on surfaces, soils, and plants, including foods, leading to potential plant uptake and human dermal exposure and ingestion. Tire wear particles can also stay near the roadway and be transported to surface waters through stormwater drains and runoff. 6PPD-q in surface waters can be ingested and absorbed by fishes. Exposed organisms can be ingested by humans and other species. 6PPD-q can potentially be mitigated by green stormwater infrastructure. Research is ongoing to further define 6PPD-q's environmental behaviors, exposures, and the potential development of adverse health outcomes. Figure credit: Hannah Vinyard, Washington State Department of Ecology.

Ecological Toxicity

Both 6PPD and 6PPD-q surpass the threshold for *very high* acute aquatic toxicity using the Globally Harmonised System of Classification and Labeling of Chemicals.¹⁸ This section focuses on 6PPD-q, which ranks as one of the most potent acute aquatic toxicants when compared to chemicals with existing Clean Water Act² Aquatic Life Ambient Water Quality Criteria. Most of the

ecological toxicity data generated thus far focuses on the acute freshwater aquatic toxicity of 6PPD-q. Two studies on the toxicity of 6PPD-q to marine organisms have been conducted,^{19,20} but no studies have been done on the toxicity of 6PPD-q to the estuarine and marine stages of salmonids, which represents a significant data gap. Sublethal effects and chronic toxicity of

What We Know: 6PPD and 6PPD-quinone

6PPD-q are being investigated. There is limited research regarding its toxicity to terrestrial species (e.g., *Caenorhabditis elegans*^{21–23}).

Acute Toxicity. Research to date has demonstrated acute toxicity to 6PPD-q in only a few species within the salmonid family, which includes salmon, char, and trout (Table 1). Coho salmon are the most sensitive species documented, with a median LC₅₀ concentration (50% mortality in lab tests) of 0.08 µg/L and death occurring within hours.^{1,2,4,24} Toxicity to 6PPD-q does not follow a phylogenetic relationship. Species within the *Oncorhynchus* genus show radically different acute toxicities, from an LC₅₀ as low as 0.040 µg/L in coho hatchlings²⁴ to no mortality observed in sockeye at 50 µg/L.²⁵ Some

salmonids in the *Salvelinus* genus (white-spotted char²⁶ and brook trout³) are acutely sensitive at relatively low concentrations (see Table 1), while others are not.³ *Oncorhynchus mykiss*, which encompasses rainbow trout (freshwater only) and steelhead (ocean-going), show mortality at higher doses and a slower onset of symptoms in response to 6PPD-q.³ The LC₅₀ for Chinook salmon is well above environmentally relevant concentrations²⁵; however, Chinook had a low level of mortality when exposed to undiluted roadway runoff.²⁷ Salmonids that do not experience acute toxicity to 6PPD-q include sockeye salmon,²⁵ Arctic char,³ Atlantic salmon, and brown trout,²⁸ as well as two varieties of Asiatic salmon: southern Dolly Varden and cherry salmon.²⁶

Table 1. Reported 6PPD-quinone LC₅₀ concentrations (50% observed mortality) of salmonids.

Species	LC ₅₀ (µg/L)	Test duration (h)	Toxicity Key
Coho salmon (<i>Oncorhynchus kisutch</i>)	0.04, ²⁴ 0.08, ²⁵ 0.095 ²	24	Higher
White-spotted char (<i>Salvelinus leucomaenis pluvius</i>)	0.51 ²⁶	24	
Brook trout (<i>Salvelinus fontinalis</i>)	0.59 ³	24	
Rainbow trout/steelhead (<i>Oncorhynchus mykiss</i>)	0.64, ²⁹ 1.0, ³ 2.26 ⁵	96	
Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	67.3 ²⁴ , 82.1 ²⁵	24	
Sockeye salmon (<i>Oncorhynchus nerka</i>)	Not acutely toxic at 50 ²⁵	24	Lower
Atlantic salmon (<i>Salmo salar</i>)	Not acutely toxic at 12.2 ²⁸	48	
Brown trout (<i>Salmo trutta</i>)	Not acutely toxic at 12.2 ²⁸	48	
Arctic char (<i>Salvelinus alpinus</i>)	Not acutely toxic at 12.7 ³	24	
Southern Dolly Varden (<i>Salvelinus curilus</i>)	Not acutely toxic at 3.8 ²⁶	48	
Cherry salmon (<i>Oncorhynchus masou masou</i>)	Not acutely toxic at 3.5 ²⁶	48	

Note: Example species in the table are listed from very high to low across a toxicity gradient based on the LC₅₀ value, with the following ratings: coho = very high; white-spotted char and brook trout = high; rainbow trout / steelhead = medium high; Chinook salmon = medium low; and sockeye salmon, Atlantic salmon, brown trout, Arctic char, southern Dolly Varden, and cherry salmon = low. Chinook salmon were assigned medium-low toxicity out of an abundance of caution. They have an LC₅₀ above environmentally relevant concentrations and potentially above some of the salmonids listed below it in the table.

Nevertheless, Chinook showed low levels of mortality in undiluted roadway runoff, which could be a result of 6PPD-q or another contaminant. Until further research clarifies whether any life stage of Chinook experiences acute mortality in response to 6PPD-q at potentially environmentally relevant exposures, they were assigned medium-low toxicity.

What We Know: 6PPD and 6PPD-quinone

Chum salmon (*Oncorhynchus keta*) do not show toxicity to roadway runoff²⁷ or tire leachate³⁰ but have not been tested with 6PPD-q. Outside the salmonid family, environmentally relevant concentrations of 6PPD-q (up to 2.8 µg/L) are not fatal to several fishes (white sturgeon,³ zebrafish, and medaka³¹) and aquatic invertebrates (*Daphnia* and the crustacean (*Hyaella azteca*)).³¹ Toxicity studies on 6PPD-q in marine invertebrates, *Brachionus koreanus*¹⁹ and *Parhyale hawaiiensis*,²⁰ indicated no acute toxicity.

Acute symptoms mimic respiratory distress and include gasping at the water's surface, fin splaying, and loss of equilibrium³²; onset of symptoms can occur within 90 minutes.¹ Examples of the effects are shown in the [Puget Soundkeeper — Longfellow Creek coho salmon video](#). Scientists are still working to determine how 6PPD-q causes mortality in fish. Researchers have demonstrated exposure to roadway runoff causes fluid to leak out of the blood vessels in the gills and brain of coho, demonstrating that the blood–brain barrier is compromised in coho.³³ Mahoney and colleagues provide evidence that energy production at the cellular level may be disrupted.³⁴ The researchers further suggest that the potential inability of sensitive species to metabolize 6PPD-q into a less toxic form may contribute to its selective toxicity.³⁴

Sublethal toxicity. It is still unknown whether 6PPD-q causes sublethal toxicity in wild fish populations. Sublethal effects could impact growth and reproduction and make fishes susceptible to other stressors, such as pathogens, higher temperatures, or other poor water quality parameters. Additional studies are needed to determine the concentrations of 6PPD-q that could result in adverse effects to salmonids, particularly because some populations are protected under the Endangered Species Act.

Limited work has been done studying sublethal effects in zebrafish, where 6PPD-q influenced

embryo movement and heart rate.³⁵ In addition, environmentally relevant concentrations of 6PPD-q have been shown to alter the central nervous system of zebrafish, changing their exploratory behavior, wake/sleep cycle, and heart rate.³⁶ Beyond fish, chronic toxicity of 6PPD-q has been studied in *C. elegans*, a soil-dwelling round worm. The worms have neurobehavioral changes and show symptoms of oxidative stress at concentrations starting as low as 0.1 µg/L.^{21,22} At 1 µg/L the worms have diminished reproductive capacity.²³ How these results translate to salmonids that are more susceptible to acute toxicity and how these sublethal effects relate to survival of aquatic species require further research.

Human Health

This section provides the most salient (e.g., not comprehensive) toxicological information on 6PPD and 6PPD-q. The health effects of 6PPD are better characterized than 6PPD-q. The health hazards of other 6PPD transformation products remain another notable data gap.³⁷

6PPD. 6PPD is a well-documented skin sensitizer, resulting in allergic contact dermatitis in sensitized individuals.³⁸ 6PPD is also listed as a category 1B reproductive toxicant by the European Chemicals Agency (ECHA).³⁹ Exposed rats experienced prolonged and difficult birth, including some pregnant rats to the point of death.³⁹ The no adverse effect level for reproduction is 7 mg/kg body weight per day for females.³⁹ 6PPD increased fat accumulation in liver in mice that were given oral doses of 10 mg/kg body weight per day for 6 weeks.⁴⁰ Similarly, ECHA identified the liver and blood cells as targets of toxicity in a 28-day oral exposure rat study. Effects on the liver were reversible at 20 mg/kg body weight per day, and both sexes showed fat deposition in the liver and anemia at 100 mg/kg body weight per day.³⁹

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6PPD-quinone. 6PPD-q is predicted to cause oxidative stress.⁴¹ 6PPD-q increased lipid accumulation in the livers of mice that were given oral doses of 10 mg/kg body weight per day for 6 weeks.⁴⁰ In addition, 6PPD-q increased liver triglycerides at all doses tested (10, 30, and 100 mg/kg body weight per day).⁴⁰

Human Exposure. 6PPD and 6PPD-q were detected in human urine in a Chinese study.¹⁷ Pregnant women's urine had the highest levels of 6PPD and 6PPD-q out of all the demographic groups in the study.¹⁷ One predicted route of exposure to these chemicals is inhalation of particulates, with the highest potential for exposure occurring near traffic (see Figure 2). Ingestion and incidental contact with rubber products or dust may be other sources of exposure to the chemicals.⁴² 6PPD and 6PPD-q are present in tire crumb rubber, and these compounds have been identified in the bioaccessible fraction after extraction of crumb rubber with simulated gastrointestinal fluid, implying they may be absorbed after ingestion.⁴³ The risk of 6PPD and 6PPD-q to people who consume high levels of aquatic species has yet to be characterized. There are limited studies on the bioaccumulative properties of 6PPD and 6PPD-q. Fang and colleagues suggest that 6PPD and 6PPD-q may bioaccumulate in the livers of lab mice⁴⁰; however, additional information regarding absorption, distribution, metabolism, and excretion by the exposed mice is needed to draw this conclusion. Contaminated sources for drinking water could potentially result in exposure depending on the source water and treatment method. Research is ongoing to address this question. Johannessen and colleagues reported negative findings in treated drinking water from two Canadian facilities.⁴⁴ No test results for U.S. drinking waters have been reported.

Environmental Justice and Tribal Government Considerations

The extent of 6PPD and 6PPD-q impacts on vulnerable populations and overburdened communities will be determined as knowledge advances. Communities near roadways are disproportionately comprised lower-income people and people of color, making the potential impacts of airborne 6PPD and 6PPD-q on these communities a notable environmental justice concern.^{45,46} Environmental justice considerations include but are not limited to food safety of fish consumption, drinking and recreational water safety, use of recycled rubber products, traffic proximity and air particulate matter exposure, socioeconomic impacts to subsistence and commercial fishers, and cumulative impacts.

Salmonid mortality, which can be caused by 6PPD-q, other toxic chemicals, climate change, habitat loss, and additional factors,¹⁸ disproportionately impacts tribal nations in North America by threatening tribal treaty rights, access to traditional foods, and the cultural and economic well-being of Indigenous peoples. Fishing rights for many tribal nations are guaranteed by treaties that have been signed, ratified, and reaffirmed by the U.S. government. Concerns for tribal nations around 6PPD-q include impaired salmon recovery and hatchery efforts, sublethal impacts to fishes, reduced ecosystem resilience, and cumulative impacts to fishes and peoples.

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Fate and Transport

Stormwater is the primary transport mechanism for 6PPD-q to surface water. TWP's are generated as tires roll across the road, particularly during acceleration, braking, and turning. These particles, and the chemicals they contain, collect in road dust until stormwater transports them into the aquatic environment. In many cities in the United States, stormwater is diverted to wastewater treatment plants (WWTPs) through combined sewer and stormwater systems. Studies investigating 6PPD-q removal in WWTPs' have had mixed results. Several studies showed a strong reduction or removal of 6PPD-q to nondetect levels,^{10,47,48} and another study showed an increase in mass in the effluent from the WWTP.⁴⁹ More research is needed to follow up on this. The presence of 6PPD and 6PPD-q in biosolids from WWTP remains a data gap.

The levels of 6PPD-q are highest during or following rain or snowmelt runoff^{8,47} and have been measured in U.S. surface waters at

concentrations above the LC₅₀ values (see Table 1) for coho, brook trout, and potentially rainbow trout.^{1,2} The levels of 6PPD-q in the water column can stay elevated for days^{6,8}; the duration depends on the frequency of inputs, the site, and the characteristics of the receiving water. Fate and transport of the chemicals in estuaries and saltwater has not yet been characterized. 6PPD-q is expected to sorb to sediment or particles^{18,50} and has been measured in sediment in China.¹⁵ Additionally, TWP's may be airborne initially and could be transported long distances. The chemical and physical properties of 6PPD-q in the atmosphere are currently unknown. Notably, 6PPD-q has been measured in particulate matter, including in airborne particles less than 2.5 µm (PM_{2.5}),^{14,51,52} road dust,^{12,53} and household dust.¹² The highest detections and concentration ranges measured in various environmental media are provided in Table 2).Table 2Table 2. 6PPD-quinone concentrations measured in roadway runoff, surface water, sediment, and particulate matter-2.5.

Media	Concentration Range	Notes	References
Roadway runoff	ND – 2.43 µg/L	Highest detection was in China by Cao et al.	2,6,9,10,54
Surface water	ND – 2.8 µg/L*	Highest detection was in the Don River in Toronto, Canada, roughly 35× higher than median coho LC ₅₀ . Loading generally correlates with the amount of rainfall.	2,7,8,54–56
Sediment	ND – 18.2 ng/g	Highest in urban river sediment, present in deep sea sediment in China.	15
Particulate matter (up to PM _{2.5})	0.1 – 7,250 pg/m ³	Highest detection alongside a road in Guangzhou, China.	14,51,52

*Median LC₅₀ for coho (0.08 µg/L), brook trout (0.59 µg/L), and rainbow trout (1.0 µg/L) (see Table 1).

Notes: µg/L = microgram per liter, ng/g = nanogram per gram dry weight, ND = nondetect, pg/m³ = picogram per cubic meter

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Monitoring and Analytical Methods

Monitoring for 6PPD and 6PPD-q in air, soil, surfaces, and water is challenging because environmentally relevant concentrations may be low and presence may be intermittent. Sampling studies indicate that 6PPD-q is detected at higher concentrations during or following rain and snowmelt events that occur following an extended dry period.^{8,56} The rate of transport of stormwater and exposure to aquatic life increase with percent impervious surface within a watershed.^{8,56} Studies have shown that 6PPD-q can persist for days in urban areas during or following storm events.^{8,57} Efforts are underway by the state of Washington to evaluate passive sampling technologies and effectiveness.

The U.S. Environmental Protection Agency is developing a 6PPD-q test method for surface water and stormwater that is projected to be available late in 2023. *Standard Operating Procedure (SOP): Extraction and Analysis of 6PPD-q* (Mel730136, Version 1.2)⁵⁸ contains procedures for the extraction and the qualitative and quantitative analysis of 6PPD-q by triple quadrupole mass spectrometry. The standard operating procedure recommends the sample collection, preservation, storage, and holding times. In addition, several commercial and research laboratories can test for 6PPD-q in water.

Other media. Standardized methods are currently in development for sediment and biological tissues. 6PPD-q has been measured in the air by academic researchers,^{14,51,52} but there is not a verified method for regulatory testing.

Stormwater Best Management Practices

Stormwater research is focused on determining the effectiveness of existing and new BMPs at 6PPD-q removal, modifying stormwater systems to improve 6PPD-q removal, adding BMP retrofits to urban roadways that lack adequate space for green infrastructure, and refining green stormwater infrastructure to maximize 6PPD-q filtration.

Effective Stormwater Mitigation Technologies. A recent Washington State publication⁵⁹ evaluated stormwater BMP treatment mechanisms and rated their expected 6PPD and 6PPD-q removal effectiveness. Several source control, flow control, and runoff treatment stormwater control measures were found to be potentially effective solutions. Washington State is funding research to verify the efficacy of these BMPs and stormwater control measures.

Researchers have demonstrated that running stormwater through the bioretention soil mix (stormwater compost and sand) that is designed as a component of a bioretention system (Figure 3) prevents acute mortality in coho.^{60,61} Research to optimize the depth and composition of the bioretention soil mix to maximize the effectiveness and longevity of the system is ongoing. Additionally, different media are being tested to reduce potential nutrient leaching from bioretention BMPs. Preliminary results of a study representing an accelerated timeline of 10 water years by passing water contaminated with 6PPD-q through a laboratory-managed bioretention soil mix shows prevention of coho mortality over the 18-month study period; the results of this study are being prepared by McIntyre and colleagues.

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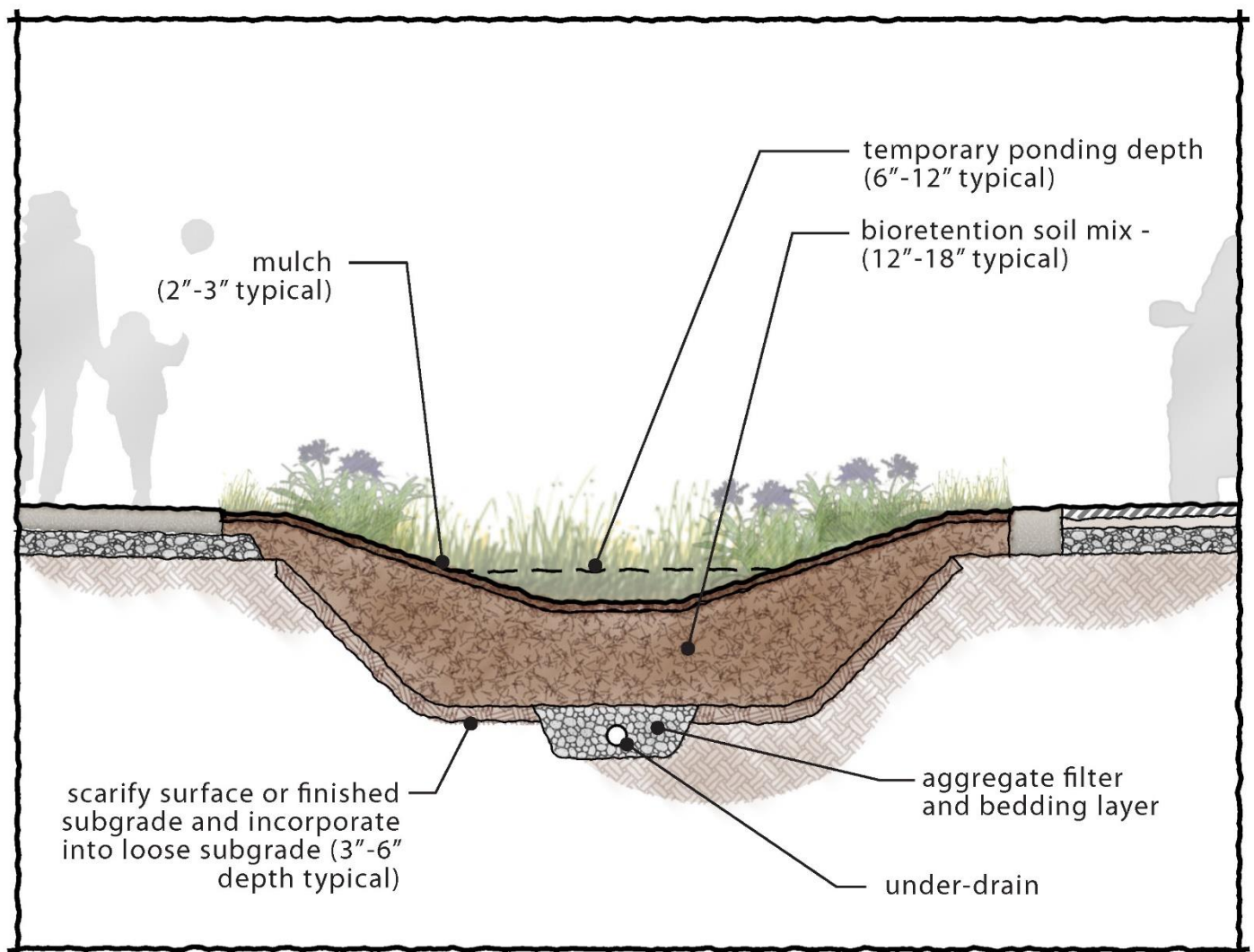


Figure 3. Typical bioretention system with design features. Current research is focused on optimizing the depth and composition of the bioretention soil mix. Courtesy of AHBL, Inc.

Researchers are also using compost-amended biofiltration swales comprising topsoil, compost, and vegetation (Figure 4) to determine the effectiveness of biofiltration systems alongside roadways; the results of this study are being prepared by Tian and colleagues. Preliminary results of the study show variability in compost-amended biofiltration swales performance across seasonal and storm specific parameters, with an efficiency of up to 80+% removal of 6PPD-q.

Identifying Vulnerable Aquatic Areas.

Washington State is developing strategies to focus sampling and stormwater mitigation efforts in locations where 6PPD-q is having a critical environmental impact. The development of these strategies is based on collaboration with tribal governments, community engagement, and available GIS mapping tools containing parameters that are assumed to influence concentrations of 6PPD-q in surface waters.

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Figure 4. Example of a compost-amended biofiltration swale. Stormwater is filtered as it flows along the grass in the swale and infiltrates into the topsoil and compost. Photo: Washington State Department of Transportation.

Factors used to identify these areas include, but are not limited to, level of traffic, impervious surfaces, precipitation, media composition that stormwater travels through to get to receiving water, size of the receiving water, and the presence of sensitive species.

Other ongoing research includes the effectiveness of permeable pavement to capture tire particles, analysis of different compost medias and biochar to determine the effectiveness of organic matter in bioretention systems, and evaluation of existing street-sweeping technologies and practices (timing and frequency) on removal of 6PPD and 6PPD-q from roadways.

Alternatives to the Use of 6PPD in Tires

Identifying and deploying alternatives to 6PPD in tires can ultimately reduce or eliminate 6PPD-q in the environment. Currently, 6PPD is necessary for tire safety and to extend the life of tires by preventing cracking and degradation caused by ozone. Discussions with tire manufacturers have revealed that an anti-degradant is not currently available to replace 6PPD. Tires are complex products with tire safety as a principal design priority, and a fully functional anti-degradant is a necessity. Research is ongoing to identify safer alternative chemicals that provide the functionality of 6PPD in tires.⁶² Due to the complexity of identifying, testing, and implementing a suitable alternative to 6PPD, the U.S. Tire Manufacturers Association cannot estimate the time frame for the replacement at this stage of the process. The states of California and Washington are pursuing policies to promote the advancement of alternatives to 6PPD in tires.

State Policies and Regulations

Washington State is developing a statewide action plan, funding research to fill in data gaps, assessing other potential tire anti-degradants, and developing specific data requirements and standards to assess the hazards of the alternatives. [Technical Memo: Assessment of Potential Hazards of 6PPD and Alternatives](#)⁶³ provides an overview of known toxicological hazards of chemicals that are or have been used as anti-degradants in tires. Washington State is currently developing hazard criteria to define “safer” when looking at alternatives to 6PPD. There is currently no estimated timeline for completion of the action plan or alternatives assessment. The [Safer Products for Washington](#) program, which aims to reduce toxic chemicals in consumer products, identified 6PPD as a priority chemical. Washington and California supported

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the [Collaborative Innovation Forum: Functional substitutes to 6PPD in tires to develop a road map for identifying safer alternatives to 6PPD](#).⁶²

California's Department of Toxic Substances Control will begin regulating [6PPD in motor vehicles](#) through the [Safer Consumer Products Program](#) on October 1, 2023. These regulations require tire manufacturers to analyze the hazards and adverse environmental impacts of potential alternatives to 6PPD, as well as evaluate the benefits and tradeoffs of replacing 6PPD. This process leverages the technical expertise of the tire manufacturers and enables them to meet

vehicle safety and consumer product safety requirements, while providing a rigorous, transparent, and scientific framework to evaluate and compare potential alternatives to 6PPD. The tire manufacturers' initial screening of potential alternatives is due on March 29, 2024.

6PPD is on Minnesota's Toxic Free Kids Act Chemicals of High Concern List,⁶⁴ and the state's legislature appropriated nearly half a million dollars for research on 6PPD-q and its effect on state fishes.⁶⁵ Maine also includes 6PPD on its Chemicals of Concern list.⁶⁶

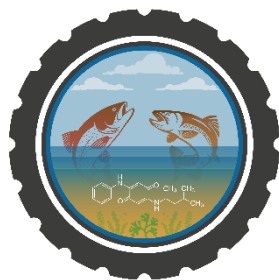
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This fact sheet incorporates data through July 2023.

The **Interstate Technology and Regulatory Council (ITRC)** is a state-led environmental coalition working to create innovative solutions and best management practices. ITRC produces documents and training that broaden and deepen technical knowledge and expedite quality regulatory decision-making while protecting human health and the environment. In January 2023, ITRC started the Tire Anti-degradants (6PPD) Team to provide guidance documents and tools on 6PPD and 6PPD-quinone for environmental officials.



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What We Know: 6PPD and 6PPD-quinone

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Fw: 🕒 TOMORROW !! EPA WEBINAR Part 2 of FRAP

Beth Melofchik <tankmadel@yahoo.com>

Tue 4/16/2024 12:57 PM

To: ConComm <ConComm@town.arlington.ma.us>; Susan Chapnick <s.chapnick@comcast.net>

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Please share with Superintendent Homan.

Beth Melofchik

 EPA logo

Federal Research on Recycled Tire Crumb Used on Playing Fields and Playgrounds

EPA and ATSDR Release the Synthetic Turf Field Recycled Tire Crumb Rubber Characterization Research Final Report: Part 2 -Tire Crumb Rubber Exposure Characterization

On April 16, 2024, the U.S. Environmental Protection Agency and the Agency for Toxic Substances and Disease Registry are releasing the *Synthetic Turf Field Recycled Tire Crumb Rubber Characterization Research Final Report: Part 2 -Tire Crumb Rubber Exposure Characterization*. The report can be found [here](#).

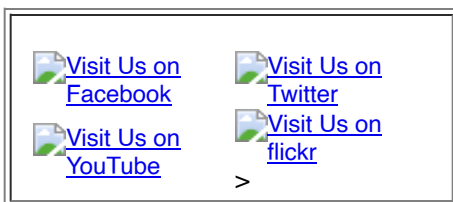
This report is part of the Federal Research Action Plan (FRAP) on Recycled Tire Crumb Used on Playing Fields and Playgrounds, a multi-agency research effort launched in 2016 by EPA, the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR), and the Consumer Product Safety Commission (CPSC) to characterize the chemicals associated with tire crumb rubber and to identify the ways in which people may be potentially exposed to those chemicals based on their activities on synthetic turf fields.

As a part of this plan to help address concerns raised by the public about potential exposures and health effects due to the use of recycled tire rubber as infill material on fields, EPA and ATSDR released the Tire Crumb Rubber Characterization (Part 1) Report in 2019. Because it is critical to understand what is present in the material (Part 1 Report) and how individuals are potentially exposed to understand potential risk, EPA and ATSDR completed an exposure characterization study. This pilot-scale exposure characterization study, described in the Tire Crumb Rubber Exposure Characterization (Part 2) report, includes questionnaire and video-based activity assessments, exposure modeling, and collection of field, personal, and biological samples. Field and personal samples were analyzed for metals, semivolatile compounds (SVOCs), and volatile organic compounds (VOCs); biological samples were analyzed for metals and polycyclic aromatic hydrocarbons. As part of this effort, ATSDR completed a supplemental biomonitoring study investigating polycyclic aromatic hydrocarbon exposure in people using fields with tire crumb rubber and natural grass fields.

To learn more about the results of the exposure characterization study as well as the overall findings from the entire playing fields portion of the FRAP activities (both the Tire Crumb Characterization Part 1 and the Tire Crumb Exposure Characterization Part 2 combined), please join us for an [EPA Tools and Resources Webinar](#) on April 17 from 3:00 to 4:00 p.m. EST. Registration is required and the link to register can be found [here](#).



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PFOA PFOS declared hazardous substances

Beth Melofchik <tankmadel@yahoo.com>

Fri 4/19/2024 10:49 AM

To: ConComm <ConComm@town.arlington.ma.us>; Susan Chapnick <s.chapnick@comcast.net>; Chuck Tirone <ctirone@ci.reading.ma.us>

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This may be relative to work of the ConCom

[EPA moves to make US polluters pay for cleanup of two forever chemicals](#)



EPA moves to make US polluters pay for cleanup of two forever chemicals

Superfund law requires industries responsible for PFOA and PFOS contamination in water or soil to pay for cleanup

PFAS new regulations for water

Beth Melofchik <tankmadel@yahoo.com>

Fri 4/19/2024 3:47 PM

To: ConComm <ConComm@town.arlington.ma.us>; Susan Chapnick <s.chapnick@comcast.net>; Chuck Tirone <ctirone@ci.reading.ma.us>

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WBUR piece on exposure in MA

Beth Melofchik

[https://www.wbur.org/news/2024/04/19/massachusetts-pfas-forever-chemicals-new-regulations?
utm_source=WBUR+Editorial+Newsletters&utm_campaign=9fb855d231-
EMAIL_CAMPAIGN_2024_04_19_11_43&utm_medium=email&utm_term=0_d0781a0a
0c-9fb855d231-%5BLIST_EMAIL_ID%5D](https://www.wbur.org/news/2024/04/19/massachusetts-pfas-forever-chemicals-new-regulations?utm_source=WBUR+Editorial+Newsletters&utm_campaign=9fb855d231-EMAIL_CAMPAIGN_2024_04_19_11_43&utm_medium=email&utm_term=0_d0781a0a0c-9fb855d231-%5BLIST_EMAIL_ID%5D)

Plastic production unsustainable vs climate

Beth Melofchik <tankmadel@yahoo.com>

Mon 4/22/2024 10:09 AM

To:ConComm <ConComm@town.arlington.ma.us>

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David, I hope ConCom will consider communicating the big Science picture to the community.

I have attended webinars on pollution in plastic production in Texas and Louisiana, on realities of fracking and cracker plants in Pennsylvania.

Arlington would benefit from a broad plastic use reduction bylaw. I hope ConCom might consider bringing one forth next Fall or Spring. Cafeterias should be plastic free, parks should have wooden benches otherwise the byproducts of production poison our conservation land and water bodies. And, playing fields should breathe and support insect life not be laminated with plastic carpet, our neighboring wetlands suffer. Beth

[Plastic-production emissions could triple to one-fifth of Earth's carbon budget – report](#)



Plastic-production emissions could triple to one-fifth of Earth's carbon...


Exclusive: By the middle of the century, pollution from plastic industry could 'undermine world's effort' to con...

Spy Pond Trails Day Sat. May 11 9am-1pm

Brad Barber <bradb@shore.net>

Sun 4/21/2024 11:40 PM

To: David White <dwhite@gilbertwhite.com>; Kaplan, David <dkaplan31@gmail.com>; Susan Chapnick <s.chapnick@comcast.net>; David Morgan <dmorgan@town.arlington.ma.us>; Ellen Reed <eltreed@gmail.com>; Natasha Waden <nwaden@town.arlington.ma.us>; Carolyn White <cawhitema@gmail.com>

 1 attachments (302 KB)

2024-05-11 Spy Pond Trails Day.pdf;

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi all,

The annual event Spy Pond Committee is Trails Day on May 11. An announcement is attached. We remove invasives, pick up trash, and help keep the path between Spy Pond and Route 2 an attractive location for walking, fishing, bird watching, biking, and enjoying our beautiful Spy Pond.

Check in at the tent halfway between Lake and Pleasant Street and sign a release form (under 18 needs parent approval). Refreshments, donuts, and coffee provided. Bring a lunch, if you wish, for afterwards.

Saturday, May 11, 9am to 1pm -- rain date May 12


--Brad

Administrative Review Inquiry, 616 Summer St

Daniel Lee Harple <leeharple@gmail.com>

Mon 4/22/2024 12:46 PM

To: ConComm <ConComm@town.arlington.ma.us>

 2 attachments (3 MB)

2024-616 Summer St Administrative Review Form.pdf; 2024-616 Summer St Site Plan.png;

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Dear Members of the Arlington Conservation Commission,

I am seeking approval for a project at my property, 616 Summer St. I would like to replace my existing driveway.

I believe Section 8 of the Arlington Wetlands Protection Regulations (*Conservation Agent Administrative Review of Minor Projects or Work*) would be applicable for this inquiry.

I have attached the *Administrative Review Form* document and a site plan of the proposed work.


Best regards,
-Daniel Harple

New kiosk at AGM near Sheila Road

David White <dwhite@gilbertwhite.com>

Sun 4/21/2024 5:41 PM

To:David White <dwhite@gilbertwhite.com>

 1 attachments (2 MB)

AGM Kiosk 2024-04-21.jpeg;

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Eagle Scout candidate Ben Gregory and associates have installed a new kiosk at AGM near the Sheila Road entrance on the loop trail.

Photo attached.

David

Mt Gilboa Options

David White <dwhite@gilbertwhite.com>

Wed 4/24/2024 11:20 AM

To:mhl@marthalyon.com <mhl@marthalyon.com>

Cc:ConComm <ConComm@town.arlington.ma.us>

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Martha,

One option that I think should be looked at for Mt Gilboa is the removal of the structures and most of the paving from the top of the hill along with a rough idea of the cost of that.

That could be the starting point for a number of alternative designs:

1. Overlook with ADA accessibility and parking.
2. Total restoration of the top area into a natural state (for an example see Whipple Hill in Lexington).

We really need to move from focus on the structures and towards the area as a natural open space.

Thanks,

David White

RE: Upper Mystic Lake Dam - Potential Equipment Addition

Galvin, Mike (DCR) <mike.galvin@mass.gov>

Tue 4/23/2024 2:52 PM

To: David Morgan <dmorgan@town.arlington.ma.us>; Gode, William (DCR) <william.gode@mass.gov>

Cc: ConComm <ConComm@town.arlington.ma.us>

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David,

Hello, this is Mike Galvin, project manager both for the 2009-11 rehabilitation of the Upper Mystic Lake Dam (which included the fish ladder) and now this project to improve fish passage. The rehabilitated dam's fish ladder was a remarkable improvement when it was opened over a dozen years ago, increasing from the thousands of fish a local bucket brigade was able to lift over the dam each year to hundreds of thousands of fish getting upstream to spawn as measured by the Mystic River Watershed Association. However, over the years there are times during the spring and summer when the variable flows of the Aberjona River lead to conditions where fish are coming over the dam without enough flow to usher them quickly to the Lower Mystic Lake. This condition creates a situation where seagulls are having too easy of a time feeding on these down runners, the predation Bill writes about below. A condition that is leading to the survival of the fattest instead of the survival of the fittest. We have engaged a consultant to analyze this situation and provide suggestions to help eliminate this problem. The first suggestion was to deploy a turbidity curtain boom in front of four of the six bays of the primary spillway, guiding the down-runners to the bay that was designed to be the primary path of the down runners to the lower Mystic Lake. We have discussed this with the Division of Marine Fisheries and have their support. Our goal would be to move through DCR's required purchasing process as quickly as possible and deploy a boom as part of a maintenance operation this year, to help the fish passage operate as the design intended.

Mike Galvin

DCR

WaterResources and Flood Control Engineering

Mike.Galvin@mass.gov

From: David Morgan <dmorgan@town.arlington.ma.us>

Sent: Monday, April 22, 2024 8:38 AM

To: Gode, William (DCR) <william.gode@mass.gov>

Cc: Galvin, Mike (DCR) <mike.galvin@mass.gov>; ConComm <ConComm@town.arlington.ma.us>

Subject: Re: Upper Mystic Lake Dam - Potential Equipment Addition

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Thanks, Bill, for the advance notice. I imagine the boom is temporary, is that right? Can you say a bit more about the kind of predation you're looking to prevent, just for context?

Cheers,

David

David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012

Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.

From: Gode, William (DCR) <william.gode@mass.gov>
Sent: Friday, April 19, 2024 1:54 PM
To: David Morgan <dmorgan@town.arlington.ma.us>
Cc: Galvin, Mike (DCR) <mike.galvin@mass.gov>; Gode, William (DCR) <william.gode@mass.gov>
Subject: Upper Mystic Lake Dam - Potential Equipment Addition

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Hello David,

My group within DCR has responsibilities for operation of the Upper Mystic Lake Dam, a portion of which is in the Town of Arlington. I'm reaching out to touch bases with you owing to the possibility that DCR will be deploying a boom in front of the spillway soon in an effort to mitigate predation on the spillway apron. While the boom will be free-floating, and won't touch the bottom of the Lake, its presence may result in questions coming your way and I'd like you to know about the matter before such questions should arise.

DCR is working in conjunction with the Division of Marine Fisheries in this effort. As plans develop I'd like you to have the opportunity to see them. If you'd like to reach out to me in the interim, please call my cell at 617/828-1629.

Thank you,
Bill Gode

William A. Gode-von Aesch, Director
Flood Control Management and Navigational Operations Section
Design and Engineering
Department of Conservation and Recreation
New Charles River Dam
250 Warren Avenue
Charlestown, MA 02129


Tel. 617/727-0488
Email: william.gode@mass.gov

Japanese knotweed getting established in a new location

Jacob Evans <jevans478@gmail.com>

Fri 4/19/2024 7:28 AM

To:ConComm <ConComm@town.arlington.ma.us>

 2 attachments (8 MB)

20240419_072040.jpg; 20240419_072050.jpg;

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Good morning, I'm not sure if this is information that'll be useful to you but I saw what I think is Japanese knotweed popping up for what I'm guessing is the first time since there's no dead stalks around from last year. It's near the sports fields at the end of Margaret street. I've attached a close up for identification and a picture taken further back to help with finding the location.

My understanding is that knotweed is very difficult to remove properly and without spreading it further, so I felt like I should let someone with training know first, though if there's anything I can do to help, I'm happy to do so.

Thanks,

Jacob Evans

Falling Tree Concerns

Jude Marcotte <jmarcotte@firstrealtymgt.com>

Fri 4/19/2024 2:59 PM

To: ConComm <ConComm@town.arlington.ma.us>

Cc: Brian Gajewski <bgajewski@firstrealtymgt.com>; Duarte Raposo <draposo@firstrealtymgt.com>; Marcia Good <mgood@firstrealtymgt.com>

📎 3 attachments (17 MB)

IMG_3537.jpeg; IMG_3539.jpeg; IMG_3540.jpeg;

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Good afternoon,

My name is Jude Marcotte, and I am the Property Manager for the Colonial Village Condominium Trust on Colonial Village Drive in Arlington, MA. We have some trees that appear to be dead and are almost falling on to our property. One tree is being held up by another, and we fear that on a windy day, it could send this down on to the parking spaces/cars below. I had reached out to the Town of Arlington DPW but they stated that these trees are located on Conservation land, and that we would have to contact the Conservation Commission of Arlington. We also wanted to bring to your attention the potential issue of downed trees and vines starting to clog up the brook that wraps around our property line. I have attached some photos to reflect some, but not all our concerns. Would someone be able to come out to look at these? We can coordinate to have someone meet you on site to do so. We look forward to hearing back from you.

Thank you,



Jude R. Marcotte Jr. | Condo Portfolio Manager

First Realty Management Corp. AMO®

151 Tremont Street | Boston | M.A. | 02111

P: 617.423.7000 ext 3726

F: 617.542.0902

jmarcotte@firstrealtymgt.com | <http://www.firstrealtymgt.com>

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Spy Pond Japanese Knotweed question

Kirsty Bennett <kirsty1@gmail.com>

Mon 4/22/2024 10:32 AM

To: ConComm <ConComm@town.arlington.ma.us>; bradb@shore.net <bradb@shore.net>; sjricci@flagshipventures.com <sjricci@flagshipventures.com>

 3 attachments (9 MB)

IMG_5828.HEIC; IMG_5831.HEIC; IMG_5829.HEIC;

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Dear Brad and Steve,

Yesterday I was at the play structure behind the ABGC and noticed that the yard belonging to the Elks Club next door (where they store their kayaks) is starting to get overrun with Japanese Knotweed. I attached some pics.

I want to let them know, in case they are not aware of the problem. But I wanted to get in touch with them and offer some advice on removal, not just flagging up the problem, just to be a bit more helpful! There seem to be a lot of different suggestions on the internet about how to remove knotweed and I know it's a total bear to get rid of it, so I was hoping for some advice, and any resources I could point them to.

Thanks for your help!

Warmly,

Kirsty
9176554392


Concern about Real Estate Marketing Discussions in Mt. Gilboa Feasibility Study

Sue Doctrow <srdoctrow@gmail.com>

Wed 4/24/2024 11:36 AM

To: ConComm <ConComm@town.arlington.ma.us>

Cc: Clarissa Rowe <clarissa.rowe@comcast.net>; Elisabeth Carr-Jones <elisabeth@carr-jones.com>; Wendy Richter <richterg@aol.com>; David F. Swanson <dswanson922@gmail.com>; Mayer Leslie <lesliemayer58@gmail.com>; McBride Brian <brianmcb@outlook.com>; David E. White <dwhite@gilbertwhite.com>; Christine Bongiorno <CBongiorno@town.arlington.ma.us>; David Morgan <dmorgan@town.arlington.ma.us>

 1 attachments (24 KB)

Ltr-2016 Warrant Article 30.pdf;

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Dear Conservation Commissioners,

After attending the April 18, 2024 Conservation Commission meeting, I am writing with great concern about potential sale of the Lester Hayden house/garage and, with it, some of the land, on top of Mt. Gilboa. As you know, an update memo (April 5 by Martha Lyon and Daphne Politis) described, under "stakeholder engagement", an on-site meeting to discuss "how the house could be marketed and sold" with a real estate professional, Nellie Aikenhead. In her presentation, I believe that Martha Lyon indicated that her discussion with Ms. Aikenhead was more extensive than she had time to describe.

My husband John and I have been residents of Westminster Ave since 2003, "near-abutters" of Mt. Gilboa (via our next-door neighbor and the Park Place house behind us). I was involved in 2021 discussions, mainly on our Mt. Gilboa Neighborhood email list, that led to the successful CPA application to fund the feasibility study that is now underway. Among the participants in parts of that email thread were then-Town Manager Adam Chapdelaine and current Town Manager Jim Feeney (as, at the time, Deputy Town Manager), as well as Commissioner David White, who is also a Town Meeting Member in our precinct; Susan Chapnick (then Chair of the Commission) and Emily Sullivan (then Environmental Planner/Conservation Agent) participated, too, especially to update us on the FY2023 CPA application. The primary focus of that discussion, and the intended feasibility study, was to explore potential uses for the house and garage and/or their removal to use the site at the top of the hill for a conservation-compatible purpose (e.g a scenic overlook).

Shortly after that discussion occurred, I joined CPA Committee (CPAC) and, when we reviewed this grant application, I was glad to be able to describe its origins and my understanding of its purpose to my CPAC colleagues. Please note, however, that I am writing not on behalf of the CPAC but instead as a resident and Town Meeting Member representing my precinct, Pct 21. Still, I think the content and spirit of the CPA application, as well as the conservation/open space mission of the CPA, are highly relevant, so this context is important. I have spoken to a few fellow CPAC members about my concerns and I believe they agreed with me about this:

Nowhere in the CPA application (nor in any discussion preceding it that I can recall) was it ever anticipated that sale of the Lester Hayden house to a private (or any other) party was going to be on the table. While I appreciate that it can often be useful for a consultant to provide a variety of potential options, I assume that time/resources wouldn't have been wasted on investigating options that would never be considered. This is why learning that these marketing discussions were being held is alarming — it indicates that selling the house might, indeed, be under consideration. I really hope that it isn't. As the Mt. Gilboa CPA application itself quoted: "...structure(s) where present, are clearly accessory to the principal open space and recreational function of the property." As the application

also states, "Recognizing the unique nature of Mt. Gilboa, the Town is committed to preserving the conservation aspect of the site but is open to new possibilities for use of the building." I believe that selling off any piece of the land occupied by these structures, i.e. the house and garage, would be in clear conflict with these statements.

Like many others, but particularly residents who live within walking distance, I frequent Mt. Gilboa to walk my dog, to take a meandering route through the wooded refuge on my way to some errand, or to just wander around "getting lost", enjoying the views from either the hilltop house lot or the rocky overlook next to Westminster Ave. I am among the survey respondents who treasure the "wilderness" feel of the relatively untouched wooded trails and rocky features. I feel that the hilltop is a crucial contributor to the character of the Mt. Gilboa conservation land. Giving up any part of that hilltop to another party would be, I believe, a terrible choice for the town, no matter how much money could be gained by selling the house.

A similar idea was proposed in 2016, in a 10-voter Town Meeting Warrant Article (Article 30) to transfer the house/lot on Mt. Gilboa to the Arlington Housing Authority for use as affordable housing. While many of us in the Mt. Gilboa neighborhood have welcomed three beautiful affordable housing developments in our immediate neighborhood (Downing Square and 20 Westminster in Arlington, and FarmView in Lexington), we spoke out against Article 30, feeling that giving up any conservation land on that majestic, unique site would not be worth the few units of affordable housing it would yield. Fortunately, Article 30 gained little support. The Conservation Commission unanimously opposed the Article (see attached letter), noting that such a land transfer would be "very detrimental" to the Commission's purpose of protecting the conservation land of Mt. Gilboa. The Select Board recommended no action, with Select Board Chair Kevin Greeley stating at the hearing that he would "lay down in front of a bulldozer" to protect Mt. Gilboa!

Other than this recent, concerning update memo item, I have had no reason to believe that the Town's commitment to protecting and preserving its open space has wavered since Mr. Greeley offered to lay down in front of that bulldozer. I trust the Conservation Commission's stewardship and have appreciated its priorities on numerous issues. I was relieved and encouraged that Commissioners David White and Brian McBride (the latter also on CPAC) both spoke at the April 18 meeting in favor of retaining all the land on the top of the hill (most likely, with removal of the house) as a scenic overlook. I am writing to respectfully ask the other Commissioners to also, please, reject any proposal to sell the house/garage, on a lot of any size.

Sincerely,

Sue Doctrow

99 Westminster Avenue

TMM, Pct 21

Cc Co-chairs Arlington Open Space Committee (Elisabeth Carr-Jones and Wendy Richter), CPAC Chair (Clarissa Rowe) and CPAC co-Vice-chair (Dave Swanson); Leslie Mayer (CPAC and Mt. Gilboa neighborhood resident); Christine Bongiorno (Deputy Town Manager, CPAC); David Morgan (Conservation Agent)

1st MA Board of Health to Ban Artificial Turf Fields

Susan D. Chapnick <s.chapnick@comcast.net>

Mon 4/29/2024 6:22 PM

To: Chuck Tirone <ctirone@ci.reading.ma.us>; Nathaniel Stevens <nstevens@McGregorLaw.com>; dwhite@gilbertwhite.com <dwhite@gilbertwhite.com>; Dave Kaplan <dkaplan31@gmail.com>; mikeg125@gmail.com <mikeg125@gmail.com>; Brian McBride <brianmcb@outlook.com>; Sara Alfaro-Franco <malta123saf@gmail.com>; coleman_eileen@yahoo.com <coleman_eileen@yahoo.com>

Cc: David Morgan <dmorgan@town.arlington.ma.us>; Claire Ricker <cricker@town.arlington.ma.us>

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FYI - Please see the following notice on the recent ban of Artificial Turf Fields by the Board of Health in Oak Bluffs, Martha's Vineyard. This was voted on April 23, 2024.

<https://vineyardgazette.com/news/2024/04/23/oak-bluffs-board-health-bans-turf-fields>

Thanks,
Susan

Susan D. Chapnick, M.S.
s.chapnick@comcast.net



April 22, 2024

To Members of the Conservation Commission:

In response to the hearing on Thursday, April 1st of the proposed Thorndike Place development, we would like to address the following:

To reiterate, in BSC's letter dated February 28th, it was stated that on February 15, 2024, "BSC performed groundwater measurements of three wells installed on the site". At a previous hearing, it was requested of the Applicant to provide a log detailing the name of person(s) conducting the measurements, witnesses, the time and method used.

It is critical that BSC be held accountable for their data, therefore we respectfully request that the Conservation Commission require that BSC provide this information.

In addition, the Applicant should be **continuously monitoring** any and all wells installed on the property. Continuous monitoring of the wells is vital in order to obtain accurate data over time including the peak rise in groundwater. Monitoring wells at one moment in time, on any given day, could result in inconclusive data and missing the maximum groundwater level.

We ask that the Conservation Commission require the Applicant to continuously monitor all wells installed on the site.

Thank you on Behalf of the Coalition to Save the Mugar Wetlands,

Jeanette Cummings, 32 Dorothy Rd.
Julie DiBiase, 29 Littlejohn St.

Cc: James Feeney, Arlington Town Manager
David Morgan, Environmental Planner/Conservation Agent
Ryan Clapp, Conservation Agent
Arlington Select Board
Arlington Land Trust

April 29, 2024

Natasha Waden, Director
Town of Arlington Board of Health
27 Maple Street
Arlington, MA 476

Dear Director Waden and members of the department of Arlington Health and Human Services;

I am writing at the suggestion of Susan Chapnick, Vice Chair of the Arlington Conservation Commission (Con Comm). As a neighbor and member of the Coalition to Save the Mugar Wetlands, I am troubled by the potential adverse health effects associated with the development of the proposed Thorndike Place on Dorothy Road in East Arlington.

At the last Con Comm hearing when discussing the planting and restoration plan, I raised concerns about the possible known and yet-to-be known deleterious health impacts of the use of herbicides proposed by the developer; a sprayed application to eliminate extensive invasive vegetation. A large portion of the property is composed of wetlands and the use of herbicides near wetlands and water bodies have been found to increase algae blooms. On a personal note, a friend's brother died of Amyotrophic Lateral Sclerosis (ALS), likely caused by contact with blue-green algae blooms. The proposed use of herbicides may have adverse health consequences for the neighborhood, kids who play sports at Thorndike Field, and the wildlife that inhabit the property.

The repercussions of this development also include flooding, standing water, and destruction of the tree canopy. The 4-story building with its underground parking and impervious surfaces will certainly exacerbate local flooding. On numerous occasions though-out the years, I and others have documented standing water near Thorndike Field and on streets abutting the proposed development. Standing water creates a breeding ground for mosquitos, increasing the risk of Eastern Equine Encephalitis (EEE) and other mosquito-borne diseases. The development plan proposes the removal of many mature trees from the 17.7-acre site. Increasing scientific evidence demonstrates the public health benefits of trees ameliorating the impacts of climate change, preserving biodiversity, and promoting human health.

In summary, the proposed Thorndike Place development poses numerous concerns for the public health of Arlingtonians. I hope Arlington Health and Human Services will share these concerns by contacting the Conservation Commission and other Town officials.

Sincerely,

Lisa Fredman
63 Mott Street
Member of the Coalition to Save the Mugar Wetlands


Re: Dorothy Road Site Visit?

David Morgan <dmorgan@town.arlington.ma.us>

Tue 4/30/2024 11:01 AM

To: Scott Oran <soran@dinosaurcap.com>

Cc: Chuck Tirone <ctirone@ci.reading.ma.us>; Stephanie Kiefer <SKiefer@smolakvaughan.com>; Dominic R. Rinaldi <drinaldi@bscgroup.com>; Susan Chapnick <s.chapnick@comcast.net>

 1 attachments (91 KB)

Thorndike Place - Arlington Land Trust Water Levels - Continuous Main File.xlsx;

Hi Scott,

Please see the attached data that I requested from ALT. This includes the available readings prior to the ones I took.

Cheers,

David

David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012

Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.

From: Scott Oran <soran@dinosaurcap.com>

Sent: Thursday, April 25, 2024 12:43 PM

To: David Morgan <dmorgan@town.arlington.ma.us>

Cc: Chuck Tirone <ctirone@ci.reading.ma.us>; Stephanie Kiefer <SKiefer@smolakvaughan.com>; Dominic R. Rinaldi <drinaldi@bscgroup.com>; Susan Chapnick <s.chapnick@comcast.net>

Subject: Re: Dorothy Road Site Visit?

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Hi David....

Thanks again for sharing the data collected by ALT.

As we've had a chance to review it, I note that the two spreadsheets you shared have data from monitoring well ALT-1 from March 29, 2024 to April 13, 2024 but ALT-2 only has data from April 11, 2024 to April 13, 2024.

The data provided record groundwater elevations between elevation 3.42' and 4.18'.

I recall ALT asserting that the high groundwater recorded was about 4.50'.

The data provided don't appear to support that assertion.

Can you please ask ALT to provide any missing data?

Many thanks!

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street
Newton, MA 02465

phone 617 213 0240
email soran@dinosaurcap.com
web www.dinosaurcap.com

On Apr 23, 2024, at 12:56 PM, David Morgan <dmorgan@town.arlington.ma.us> wrote:

Hi Scott,

The Land Trust's data are not materials submitted as part of the hearing (e.g., by the applicant or a peer reviewer), so neither they nor any response you might submit regarding them are subject to tomorrow's deadline. You have until the correspondence deadline (COB on the 30th), which is when all materials need to be posted for the meeting on the 2nd. Submissions that come in later than that may be allowed at the chair's discretion.

The two wells are named ALT-1 and ALT-2. Both elevations were measured from the top of the PVC. As I have been told, ALT-1 is at 9.22' and ALT-2 is at 9.48'. I've asked for confirmation of these figures and will send any needed corrections ASAP.

Cheers,
David

David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012
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From: Scott Oran <soran@dinosaurcap.com>
Sent: Tuesday, April 23, 2024 11:48 AM
To: David Morgan <dmorgan@town.arlington.ma.us>
Cc: Chuck Tirone <ctirone@ci.reading.ma.us>; Stephanie Kiefer <SKiefer@smolakvaughan.com>; Dominic R. Rinaldi <drinaldi@bscgroup.com>; Susan Chapnick <s.chapnick@comcast.net>
Subject: Re: Dorothy Road Site Visit?

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Hi David...

PS... Sorry I replied too quickly.

Can you please note which log goes with which well and indicate the elevation of the top of the well so we all may work from the same datum?

(I believe the readings are expressed as meters from the top of the well.)

Many thanks!

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street
Newton, MA 02465

phone 617 213 0240
email soran@dinosaurcap.com
web www.dinosaurcap.com

On Apr 23, 2024, at 11:43 AM, Scott Oran <soran@dinosaurcap.com> wrote:

Thank you!

As you surely understand, with the submission deadline tomorrow at noon for the May 2 hearing, we expected the opportunity to review and comment if appropriate.

Thanks again.

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street
Newton, MA 02465

phone 617 213 0240
email soran@dinosaurcap.com
web www.dinosaurcap.com

On Apr 23, 2024, at 11:32 AM, David Morgan
<dmorgan@town.arlington.ma.us> wrote:

Hi Scott,
I'll be posting these materials for the May 2 meeting. Meanwhile, I'm
attaching the data I downloaded last we met.

Cheers,
David

David Morgan | Environmental Planner + Conservation Agent | Department of
Planning and Community Development | 781.316.3012
*Arlington values equity, diversity, and inclusion. We are committed to building a
community where everyone is heard, respected, and protected.*

From: Scott Oran <soran@dinosaurcap.com>
Sent: Tuesday, April 23, 2024 9:45 AM
To: David Morgan <dmorgan@town.arlington.ma.us>
Cc: Chuck Tirone <ctirone@ci.reading.ma.us>; Stephanie Kiefer
<SKiefer@smolakvaughan.com>; Dominic R. Rinaldi
<drinaldi@bscgroup.com>
Subject: Re: Dorothy Road Site Visit?

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especially from unknown senders.
Hi David (and Chair Tirone)...

It was very nice to see you both on April 12 to observe the
opponents' monitoring wells.

At that time, they stated they would share the data publicly and
David you said you would make it available to the public on the
commission's website.

Can you please tell me where I can find it on your website?

Many thanks!

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street, Suite 101
Newton, MA 02460

phone 617 213 0240
email soran@dinosaurcap.com
web www.dinosaurcap.com

On Apr 12, 2024, at 7:15 AM, Scott Oran
<soran@dinosaurcap.com> wrote:

Thank you!

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street
Newton, MA 02465

phone 617 213 0240
email soran@dinosaurcap.com
web www.dinosaurcap.com

On Apr 12, 2024, at 7:15 AM, David Morgan
<dmorgan@town.arlington.ma.us> wrote:

Hi Scott,
Yes, we will be there. See you in a bit.

Cheers,
David

David Morgan | Environmental Planner + Conservation Agent |
Department of Planning and Community Development |
781.316.3012

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to building a community where everyone is heard, respected, and
protected.*

From: Scott Oran <soran@dinosaurcap.com>
Sent: Friday, April 12, 2024 6:44 AM
To: David Morgan <dmorgan@town.arlington.ma.us>;
Chuck Tirone <ctirone@ci.reading.ma.us>

Cc: Stephanie Kiefer <SKiefer@smolakvaughan.com>;

Dominic Rinaldi <drinaldi@bscgroup.com>

Subject: Dorothy Road Site Visit?

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hello David and Chair Tirone...

Given this morning's rain, are you still planning to have the scheduled site visit on Dorothy Road at 8 am?

Thanks!

Best,

Scott

Scott Oran
Dinosaur Capital Partners LLC
28 Austin Street
Newton, MA 02465

phone 617 213 0240

email soran@dinosaurcap.com

web www.dinosaurcap.com

<10922409- ALT2 2024-04-12 08_30_43 EDT (Data EDT).xlsx>

<21201474 ALT-1 2024-04-12 08_29_24 EDT (Data EDT).xlsx>

<10922409- ALT2 2024-04-12 08_30_43 EDT (Data EDT).png>

<21201474 ALT-1 2024-04-12 08_29_24 EDT (Data EDT).png>



TOWN OF ARLINGTON
Department of Public Works
Office of Tree Warden
23 Maple Street
Arlington, Massachusetts 02476
Office (781) 316-3114 Fax (781) 316-3109

April 23, 2024

Via Email (jesse@pssinvestors.com)

Jesse Morgan
PSI Atlantic Arlington MA LLC
Memphis, TN 38117

RE: 34 Dudley St./ Title V, Article 16 of Town Bylaws – Tree Protection and Preservation

Dear Jesse Morgan,

Please be advised the undersigned received a report on April 12, 2024 of large trees being removed from the above-referenced site. This report prompted a site visit on April 16, 2024. During the site visit in the presence of Russell Thompson of A&E Construction Co., it was observed that four apparent Oak trees were removed from the rear setback of the property. The four Oak tree stumps remaining measured 38", 25", 12", and 8" diameter at breast height (DBH) respectively.

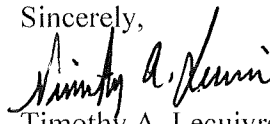
As you may recall, a Tree Plan dated October 4, 2023 was submitted for the above-referenced project. The Tree Plan, which was prepared by Registered Landscape Architect Erik Bednarek, showed four Elm trees located in the side setback were slated for removal. The Elm trees slated to be removed totaled 67" DBH. This DBH calculation served as the basis for the mitigation fee and was further codified in the approval letter from my office dated October 16, 2023.

As a result of the removal of these additional protected Oak trees, and in accordance with Article 16, you will be required to provide an additional mitigation payment to account for this unapproved canopy loss. The total additional DBH removed from the site totaled 83" DBH, requiring a mitigation payment of **\$31,125**. Please submit payment in this amount via check made

payable to the Town of Arlington with a notation of "Trees Please Fund" in the memo line at your earliest convenience. Given that this project also filed a Notice of Intent with the Conservation Commission, the Conservation Agent is copied on this correspondence in the event there are other remedial actions necessary with respect to the removal of these additional trees.

Please do not hesitate to contact the undersigned with any questions.

Sincerely,



Timothy A. Lecuivre, MCA, MQTW
Arlington Tree Warden
tlecuivre@town.arlington.ma.us

Cc. Michael Ciampa, Director of Inspectional Services
Michael Rademacher, Director of Public Works
James Feeney, Town Manager
David Morgan, Conservation Agent/Environmental Planner
Robert Annese, Counsel for the Applicant (law@robertannese.com)
Russell Thompson, A&E Construction Co. (rthompson@aeconstruction.com)
Eric Gerade, VHB (egerade@vhb.com)

Re: Thorndike Place Test Pits

David Morgan <dmorgan@town.arlington.ma.us>

Thu 4/18/2024 11:04 AM

To: Wolfgang Kirstein <wkirstein@town.arlington.ma.us>

Cc: Wayne Chouinard <wchouinard@town.arlington.ma.us>

Very helpful, thanks!

Cheers,

David

David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012

Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.

From: Wolfgang Kirstein <wkirstein@town.arlington.ma.us>

Sent: Thursday, April 18, 2024 10:44 AM

To: David Morgan <dmorgan@town.arlington.ma.us>

Cc: Wayne Chouinard <wchouinard@town.arlington.ma.us>

Subject: Re: Thorndike Place Test Pits

David,

They didn't talk much about groundwater indicators apart from where it was seeping into the excavation and where standing water was.

On TP-13 about 2.5 ft down, there possibly was a redox feature (shown below). I'm not too sure though. I didn't notice any other possible redox features in the other test pits.



Regards,
Wolfgang

Wolfgang G. Kirstein, E.I.T.
Civil Engineer
Town of Arlington Department of Public Works
Engineering Division
51 Grove Street, Arlington, MA 02476

From: David Morgan <dmorgan@town.arlington.ma.us>
Sent: Thursday, April 18, 2024 10:00 AM
To: Wolfgang Kirstein <wkirstein@town.arlington.ma.us>
Cc: Wayne Chouinard <wchouinard@town.arlington.ma.us>
Subject: Re: Thorndike Place Test Pits

Hi Wolfgang,
Thank you for going out yesterday and witnessing these test pits, it's a huge help, and thanks, too, for the excellent documentation.

Was there any assessment or talk in the field of groundwater level indicators like redox features?

Cheers,
David

David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012

Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.

From: Wolfgang Kirstein <wkirstein@town.arlington.ma.us>
Sent: Thursday, April 18, 2024 9:16 AM
To: David Morgan <dmorgan@town.arlington.ma.us>
Cc: Wayne Chouinard <wchouinard@town.arlington.ma.us>
Subject: Thorndike Place Test Pits

David,

Attached are my notes and a rough location plan from the test pits yesterday. The photos I took are located at the link below.

 [2024.04.17 Thorndike Place](#)

Regards,
Wolfgang

Wolfgang G. Kirstein, E.I.T.
Civil Engineer
Town of Arlington Department of Public Works
Engineering Division
51 Grove Street, Arlington, MA 02476

April 26, 2024

Arlington Land Trust, Inc.
Attn: Chris Leich
P.O. Box 492
Arlington, MA 02476
cmleich@comcast.net

RE: Thorndike Place, Dorothy Road, Arlington, Massachusetts – Preliminary Review of Applicant’s Groundwater Mounding Analysis

Dear Mr. Leich,

McDonald Morrissey Associates, LLC (MMA) is providing this letter in response to your request for a preliminary technical review of the groundwater mounding calculations presented by BSC Group on behalf of Arlington Land Realty, LLC (collectively referred to herein as “the Applicant”). In conducting the review, MMA primarily focused on information presented in the following documents:

- *Stormwater Report – Thorndike Place, Dorothy Road, Arlington, MA*, prepared by BSC Group on behalf of Arlington Land Realty, LLC. Revised date: August 2021 (referred to herein as BSC’s 2021 Report).
- Letter to the Town of Arlington Conservation Commission from Dominic Rinaldi of BSC Group, Inc. *RE: Response to Additional Peer Review Comments and Questions from the Commission – Thorndike Place Stormwater Peer Review*. Dated February 28, 2024 (referred to herein as BSC’s 2024 Responses).

Minimum Vertical Separation Distance

BSC’s 2021 Report states that a groundwater mounding analysis is necessary to address applicable requirements including those identified within the Massachusetts Stormwater Handbook (Mass. SW Handbook): “*As the infiltration system has more than 2-feet but less than 4-feet separation [sic] to estimated seasonal high groundwater, a mounding analysis has been performed...*”. Based on MMA’s review, this determination appears to be based on estimated seasonal high groundwater (ESHGW) elevations that are currently proposed by the Applicant but are subject to revision based on additional proposed/in-progress data collection and analysis. As noted in BSC’s 2024 Responses, the ESHGW condition currently proposed by the Applicant would only provide 2.02 feet of separation at system INF-1 (i.e., currently only meeting the requirement by 0.02 feet without consideration of pending data and analysis), with even smaller vertical separation distances applying to the proposed infiltration systems near the townhomes (i.e., INF-2 through INF-6). Thus, MMA highlights the ESHGW condition as a significant remaining

area of uncertainty relative to the proposed design that must be resolved by the Applicant to reliably demonstrate compliance with Mass. SW Handbook requirements.

Groundwater Mounding Analysis Design

Based on MMA's review, the Applicant appears to misinterpret guidance provided by the Mass. SW Handbook relative to conducting (groundwater) mounding analyses. Specifically, the Applicant incorrectly views a reference to *Required Recharge Volume* (RRV) used in the Mass. SW Handbook as a direct instruction for designing a specific loading scenario under which to evaluate resultant groundwater mounding. In the Mass. SW Handbook's discussion of mounding analysis requirements, the RRV is not being singularly used to define a specific volume of infiltration produced by an individual, hypothetical storm event, as the Applicant represents in their mounding analysis. Instead, the RRV term is being used in the Mass. SW Handbook to more generally refer to the volume of internal storage provided by the proposed infiltration practice that would fill during a storm and slowly drain via exfiltration/infiltration.

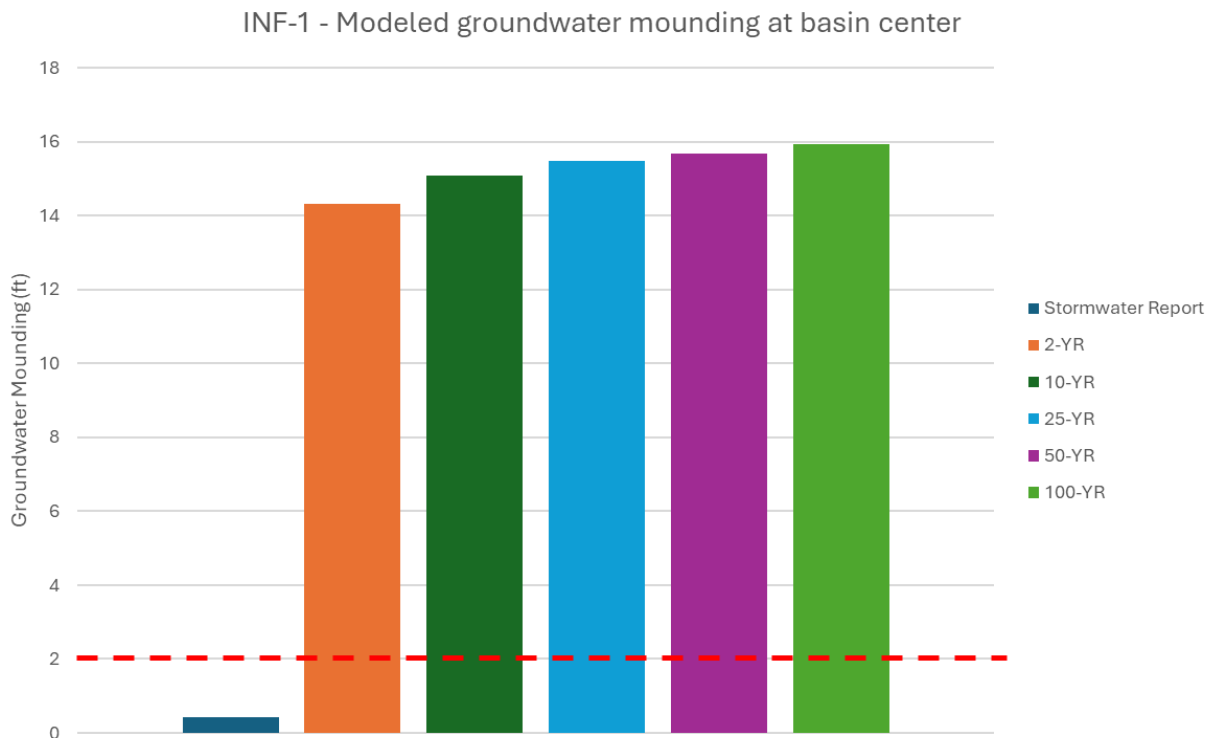
In MMA's experience, the common accepted practice for conducting mounding analyses that meet Mass. SW Handbook requirements is to use infiltration rates ***and durations*** representative of the largest (i.e., lowest probability) design events for which rate control is being provided. This approach is logical because, as acknowledged in BSC's 2021 Report, severe groundwater mounding can result in adverse hydraulic impacts that may reduce exfiltration/infiltration rates. This effect may, in turn, compromise the ability of a system to provide the intended rate control function. Our position on this matter is supported by the Mass. SW Handbook excerpts provided below, which generally refer to the need to illustrate full drainage of system storage under contemplated storm events, not just drainage capability under an artificial case based on the specific volume definition of the RRV:

- *"Infiltration structures must be able to drain fully within 72 hours"* – Vol. 1, Ch. 1.
- *"Design the subsurface structure so that it drains within 72 hours after the storm event and completely dewater between storms"*. – Vol. 2, Ch. 2.
- *"Design the system to totally exfiltrate within 72 hours"*. – Vol. 2, Ch. 2.
- *"If the [mounding] analysis indicates the mound will prevent the infiltration BMP from fully draining within the 72-hour period, an iterative process must be employed to determine an alternative design that drains within the 72-hour period"*. – Vol. 3, Ch. 1.

Ultimately, the Applicant's misinterpretation of Mass. SW Handbook guidance causes their mounding analysis to be conceptually flawed and unreliable in supporting key assumptions regarding system performance. In effect, the Applicant's analysis only provides an answer to a very specific and inappropriately narrow question: *can the proposed system exfiltrate/infiltrate a volume of water equal to the RRV without indications of adverse effects from groundwater mounding?* In actuality, the Mass. SW Handbook seeks answers to different questions that pertain more directly to evaluating

proper system functionality, for example: *can the proposed system completely drain during storm events (i.e., within the required 72-hour period) in consideration of potential adverse effects from groundwater mounding, and is it valid to assume exfiltration/infiltration rates will not be adversely impacted during storm events by groundwater mounding when conducting HydroCAD simulations to evaluate rate control performance?*

Though MMA does not endorse the Applicant’s modeling approach (i.e., utilization of the Hantush analytical model) or agree with certain inputs to the model used by the Applicant (e.g., assumed values of horizontal hydraulic conductivity and specific yield), the framework is *generally* useful for illustrating concerns relative to groundwater mounding potential associated with the proposed design. The figure below compares the Applicant’s peak mounding height prediction (referred to as “Stormwater Report”) for the INF-1 system to additional mounding height predictions based on estimated infiltration durations for the 2-, 10-, 25-, 50-, and 100-year, 24-hour storm event scenarios¹ evaluated using HydroCAD, which assumes no infiltration rate reductions due to groundwater mounding. All inputs to the model aside from the infiltration duration are unchanged (i.e., the same as those used in the “Stormwater Report” case). The dashed red line depicts the 2.02-feet of vertical separation between the bottom of INF-1 and the ESHGW elevation currently proposed by the Applicant.



¹ Infiltration durations were estimated by dividing the cumulative, event-specific discarded volumes reported by HydroCAD by the volumetric system infiltration rate (i.e., linear rate multiplied by the reported system exfiltration/bottom area). The resultant estimates are approximately 2.0, 2.1, 2.2, 2.2, and 2.3 days (47.4, 50.9, 52.7, 53.7, and 54.8 hours) for the 2-year, 10-year, 25-year, 50-year, and 100-year, 24-hour events, respectively. Note these estimates do not reflect consideration of groundwater mounding and associated infiltration rate reduction(s).

The Applicant predicts minimal mounding because they use the RRV to estimate the infiltration duration (0.051 days), and the resultant estimated duration is significantly shorter than infiltration durations estimated for the contemplated storm events (ranging from approximately 2 days for the 2-year event to approximately 2.3 days for the 100-year event). When the longer, storm-specific infiltration duration estimates are used instead, the Applicant's model predicts tremendous groundwater mounding with levels rising to unrealistic heights that significantly exceed the proposed system bottom. Consistent with the position expressed in the BSC 2021 Report, when groundwater is predicted to rise to this degree, it is an indication of a strong potential for adverse hydraulic effects that would extend system drainage times, thus warranting further analysis and potentially design adjustment. Due to the Applicant's misinterpretation of the Mass. SW Handbook, this potential—as well as the potential for other adverse effects associated with groundwater mounding—has simply not been recognized or addressed.

Groundwater Mounding Analysis Assumptions and Bases for Selected Inputs

While MMA views the aforementioned methodological flaw—including use of an erroneously short infiltration event duration—as the primary and most consequential concern relative to the Applicant's mounding analysis, our review did highlight several additional issues, including the following:

- The validity—and representativeness—of predictions yielded by the analytical model proposed by Hantush (1967) depends on conformance with the assumptions implicit in the mathematical formulation of the model itself. Of particular relevance to the Applicant's implementation is the assumption of infinite aquifer extent, which implies there are no barriers limiting horizontal flow. MMA understands the Applicant is proposing subsurface structures (e.g., building foundations with impermeable liners) that would likely render the assumption of infinite aquifer extent invalid and lead the Hantush model to produce non-conservative peak mounding height predictions. Thus, the Applicant should justify their selection of the Hantush analytical model over the use of a more robust and flexible numerical modeling approach (e.g., MODFLOW) that can better represent physical complexity, including horizontal flow barriers and additive effects from simultaneous activity (i.e., exfiltration/infiltration) by multiple systems.
- The Applicant should provide bases for *all* assumed inputs to their mounding simulations, including assigned values of aquifer specific yield and initial saturated thickness, as these inputs do influence resultant mounding height and extent predictions.
- Regarding the assumed value of horizontal hydraulic conductivity, BSC's 2024 Responses present the following claim: "*The horizontal hydraulic conductivity selected [1.04 feet per day] is a typical value for silty materials converted from 3.65×10^{-6} meters per second to feet per day*". Additional information—namely a supporting literature reference or site-specific information source—should be provided by the Applicant to validate this claim. Based on MMA's review, this

input appears to imply as assumption of a horizontal-to-vertical anisotropy ratio of approximately 1:1, which would be atypical based on industry-common ranges representative of the general character of subsurface materials present in the site vicinity (see Todd, 1980²).

The review described herein is preliminary and based on information made available to MMA as of the indicated transmittal date. MMA therefore reserves the right to amend and/or extend this commentary based on expanded review and/or review of new information provided by the Applicant or other interested parties.

Sincerely,

A handwritten signature in black ink, appearing to be 'Michael Mobile', written in a cursive style.

Michael Mobile, Ph.D., CGWP
President, McDonald Morrissey Associates, LLC

² *Groundwater Hydrology, Second Edition, 1980.* Authored by David K. Todd.

MAM/

Z:\1_Projects\Arlington\Thorndike_Place\7_Reports_and_Memos\FINAL_MMA_Mounding_Analysis_Letter_4-26-24.docx

Thorndike Place Test Pits

TP-9

7'6" to seeping water

9'8" to standing water

8'4" of fill on top of

1'6" of fine sandy loam

1'6" of fine sandy loam



10' 10" to bottom

9'4" to seeping water

10' 6" to standing water

All Fall

TP-11

9'6" to bottom

9' 3" to seeping water

9'3" to standing water

All fill

TP-12

6'4" to bottom

4' 5" to seeping water

5'8" to standing water

All full w/ many cobbles

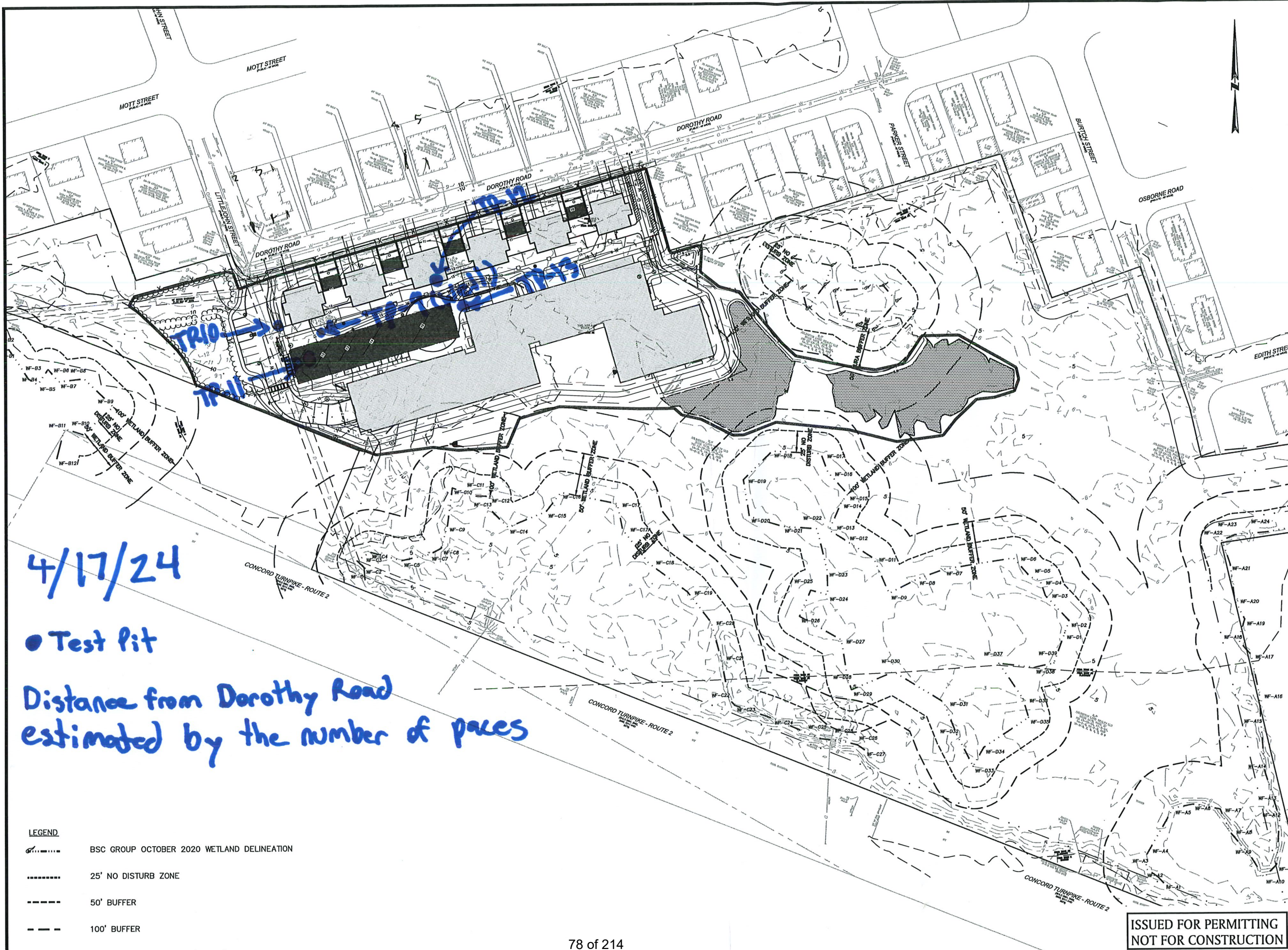
TP-13

6' 2" to bottom

4' 9" to seeping water

5' 7" to standing water

All Gill



PROFESSIONAL ENGINEER

THORNDIKE PLACE
NOTICE OF INTENT

DOROTHY ROAD
IN
ARLINGTON
MASSACHUSETTS
(MIDDLESEX COUNTY)

OVERALL SITE PLAN

SEPTEMBER 6, 2023

REVISIONS:

NO.	DATE	DESC.

PREPARED FOR:
ARLINGTON LAND REALTY, LLC
84 SHERMAN STREET, 2ND FLOOR
CAMBRIDGE, MA

BSC GROUP
803 Summer Street
Boston, Massachusetts
02127
617 896 4300

© 2023 BSC Group, Inc.
SCALE: 1" = 50'

FILE: 2340702\CD\2340702-SP2
DWG.:
JOB. NO: 23407.02

SHEET C-102

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION



January 22, 2021

BY EMAIL

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Kevin Knobloch

Anne Paulsen

Dave Rogers

Christian Klein, Chair
Zoning Board of Appeals
Town of Arlington
Arlington, MA 02476

re: Climate Resiliency Review, Mugar Lands

Dear Christian:

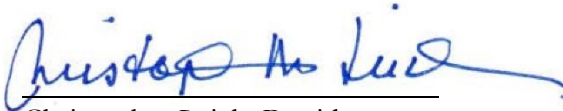
Attached for the Board's consideration is a review of climate resiliency issues with respect to the proposed development of the Mugar site.

State policy encourages, and common sense demands, that the reality of climate change be taken into account in evaluating any proposed development in this area that already experiences regular and severe flooding. A short-sighted view of the potential adverse consequences of development in the floodplain would carry increased risks to public health and safety beyond the site itself to the surrounding East Arlington neighborhoods.

The Town of Arlington through its special permit process has demonstrated a commitment to requiring that any major development with significant environmental impacts must consider the effects of climate change. Such would be the case for any development proposed on this, the most environmentally sensitive land in the Town. That this project is being conducted under Chapter 40B cannot be an excuse to hold it to a lower standard.

Thank you for your consideration.

Very truly yours,
Arlington Land Trust, Inc.

by: 
Christopher Leich, President

attachment: Weston & Sampson report
ecc: Arlington Conservation Commission c/o Emily Sullivan
Arlington Select Board c/o Lauren Costa

MEMORANDUM

TO: Arlington Land Trust

FROM: Indrani Ghosh, Resiliency Technical Leader, Weston & Sampson

DATE: January 20, 2021

SUBJECT: Resiliency review consultation services related to the East Arlington Mugar site

Weston & Sampson Engineers, Inc. (Weston & Sampson) is pleased to present this memorandum to the Arlington Land Trust to summarize climate resiliency considerations of the Thorndike Place proposed design at the East Arlington Mugar site (the “Site”) being developed by OakTree Development and designed by BSC Group.

Executive Summary

The Arlington Land Trust (ALT) engaged Weston & Sampson to evaluate the climate resiliency of the Thorndike Place design at the East Arlington Mugar site. This was presented through production of talking points for the Zoning Board of Appeals (ZBA) meeting on December 22, 2020 and this memorandum summarizing the review comments. The key considerations described in this memorandum include the following:

1. Use of FEMA Data Compared to Neighboring Communities Standards
 - a. Current design relies solely on regulatory FEMA base flood elevation (Zone AE, 100-yr floodplain, 6.8 ft NAVD88 elevation) and does not consider that the site is also located in the FEMA 500-yr floodplain, nor does it consider the effects of sea level rise and storm surge due to climate change.
 - b. The Amelia Earhart Dam actively affects flood elevations around the site. As reported in the City of Cambridge’s Climate Change Vulnerability Assessment (CCVA), the Boston Harbor Flood Risk Model (BH-FM) shows that the dam will likely be flanked in 2045 and overtopped by 2055. This overtopping or circumventing could cause the flow of water to be reversed, increasing the flood vulnerability of upstream communities.
 - c. Regional coordination is a crucial component of climate resiliency, and neighboring communities of Cambridge and Boston have already considered future flooding for resilient design.
2. Design Storm Depths

- a. The stormwater management system presented by the BSC Group meets current rainfall conditions, but it does not consider the increased magnitude of storm events in the future, such as the climate change projections for the 2070s planning horizon.
 - b. Future MassDEP wetlands regulations will likely incorporate the NOAA Plus Method for design storm depth, increasing the stormwater basin design size for most locations.
 - c. Future Climate Resilience Design Standards, as developed by the Resilient Massachusetts Action Team (RMAT), include design standards for future extreme precipitation. As demonstrated further in this memorandum, these percent increases in precipitation exceed the design storm depths considered in the proposed design of the Site.
3. Additional Resilient Design Issues:
- a. Deployable flood barriers are not recommended for precipitation flooding due to time needed for deployment and cost of retrofitting.
 - b. Buildings proposed to be in any flood hazard area must be designed in Base Flood Elevation + 1 ft of freeboard, or the Design Flood Elevation, whichever is higher according to the Massachusetts State Building Code.
 - c. Provision of a compensatory flood storage ratio of 2 to 1 will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery.
 - d. Site design does not consider or propose methods to mitigate and protect against future projections for extreme heat.

Background

History

The Site is located within a protected wetland in both a FEMA established 100-year floodplain and 500-year floodplain. OakTree Development is utilizing the Chapter 40B statute to seek to bypass the protected wetlands zoning regulations by providing a certain percentage of affordable housing in the Thorndike Place development. These wetlands serve as flood storage, and there is concern that developing on the wetlands will exacerbate an area that has already experienced extreme flooding events in recent decades. Figures 1 through 7 depict scenes after some of these previous extreme storm events. More images and videos of flooding events near the Mugar wetlands can be found at the following link: <https://www.youtube.com/watch?v=1QyLmZv1hAs>



Figure 1. People canoeing down Herbert St. & Lafayette St. after 1996 storm

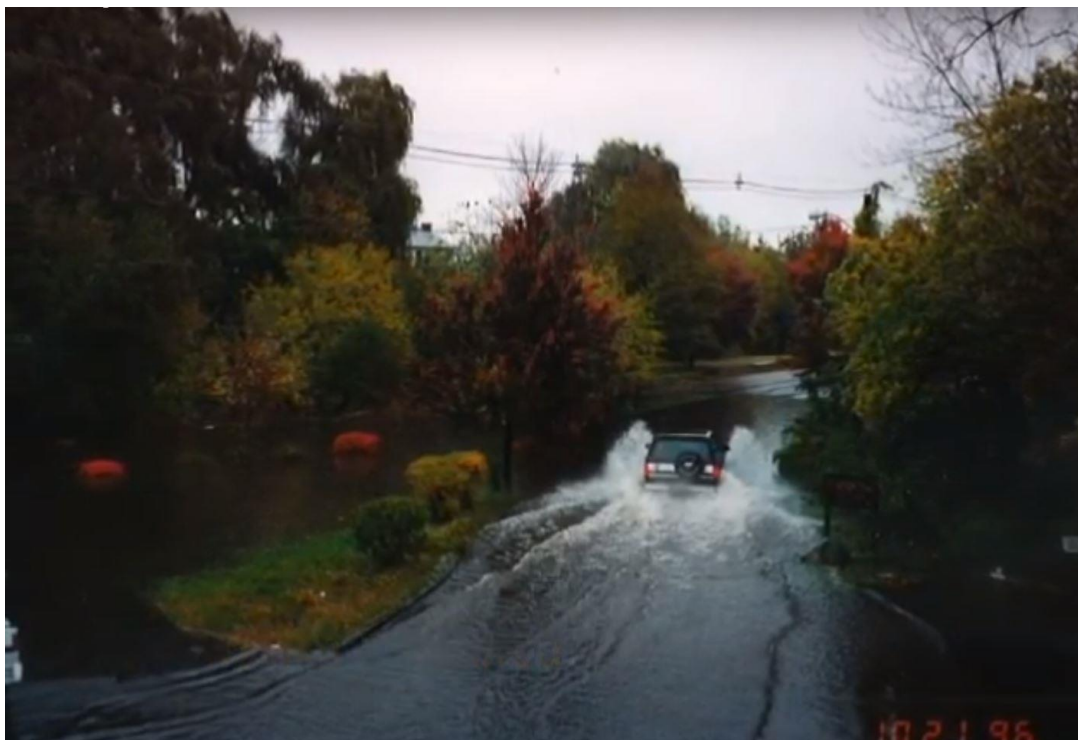


Figure 2. Flooding on Thorndike St. after 1996 storm



Figure 3. Flooding on Alewife Brook Parkway after 1996 storm



Figure 4. Car submerged on Herbert St. and Lafayette St. after 2001 storm



Figure 5. DPW pumping from Route 2 to into Mugar site wetlands during 2001 storm



Figure 6. Flooding seen on Fairmont St. after 2010 storm



Figure 7. People canoeing at Magnolia Playground after 2010 storm.

Current Design

The planned project will include a 176-unit multi-family housing complex, a percentage of which will be designated as affordable housing. There will be 239 parking spaces, with 204 of these spaces located below ground. The current design of the Thorndike Place development meets regulatory requirements, with a 2 to 1 compensatory flood storage ratio, as well as a design flood elevation (DFE) in accordance with FEMA's 100-year base flood elevation (BFE). The first floor of livable units has a DFE of 13 feet NAVD88, while the DFE of the underground parking garage is unknown. Various stormwater management systems are included in the current design such as a rooftop detention system, a trench drain, a deep sump catch basin, porous asphalt, and deployable flood barriers. A HydroCAD model was used to model the watershed, comparing both pre-development and post-development conditions of the Site. However, the proposed design does not consider sea level rise (SLR), storm surge (SS), and precipitation effects that are very likely to occur during the useful life of the proposed development due to climate change. With the current design of the proposed development, it is likely that the residents who will be inhabiting the planned affordable housing units as well as neighboring Arlington residences may be subject to significant flooding effects when an extreme storm hits.



Figure 8. BSC Group's conceptual site plan, as of September 2020

FEMA Regulations vs. Neighboring Communities

Portions of the Site lie in both the 100-year floodplain and the 500-year floodplain, as established by the Federal Emergency Management Agency (FEMA). Current Massachusetts legislature requires that buildings be designed to the 100-year BFE, which is the elevation that Thorndike Place design relies on at 6.8 feet NAVD88. Although this is the regulatory DFE for Massachusetts developments, FEMA published that, “BFEs reflect estimates of flood risk, but there are many unknown factors that can cause flood heights to rise above the BFE, such as wave action, bridge and culvert openings being blocked by debris, and development in the floodplain. It is important to remember that floods more severe than the 1- percent-annual-chance event can and do occur.”¹ This indicates that designing to the 100-year base flood elevation area may not be enough to prevent flood damage, especially in areas that are prone to flooding. Since the Site is additionally located within the 500-year floodplain, there are further concerns about the current design of the Thorndike Place development. According to flood profiles of

¹ FEMA , *Building Higher in Flood Zones: Freeboard – Reduce Your Risk, Reduce Your Premium*
https://www.fema.gov/media-library-data/1438356606317-d1d037d75640588f45e2168eb9a190ce/FPM_1-pager_Freeboard_Final_06-19-14.pdf

Alewife Brook (Little River)² created by FEMA, the 500-year elevation for the Site is 10.75 feet NAVD88. Furthermore, all of FEMA's elevations for the Site are based on data collected up to June 4, 2010, and do not consider SLR or SS effects due to climate change. The first floor living space for the Thorndike Place development is designed at an elevation of approximately 13 feet-NAVD88, making it suitable for projected SLR and SS effects, but the underground parking area is at a severe risk of flooding.

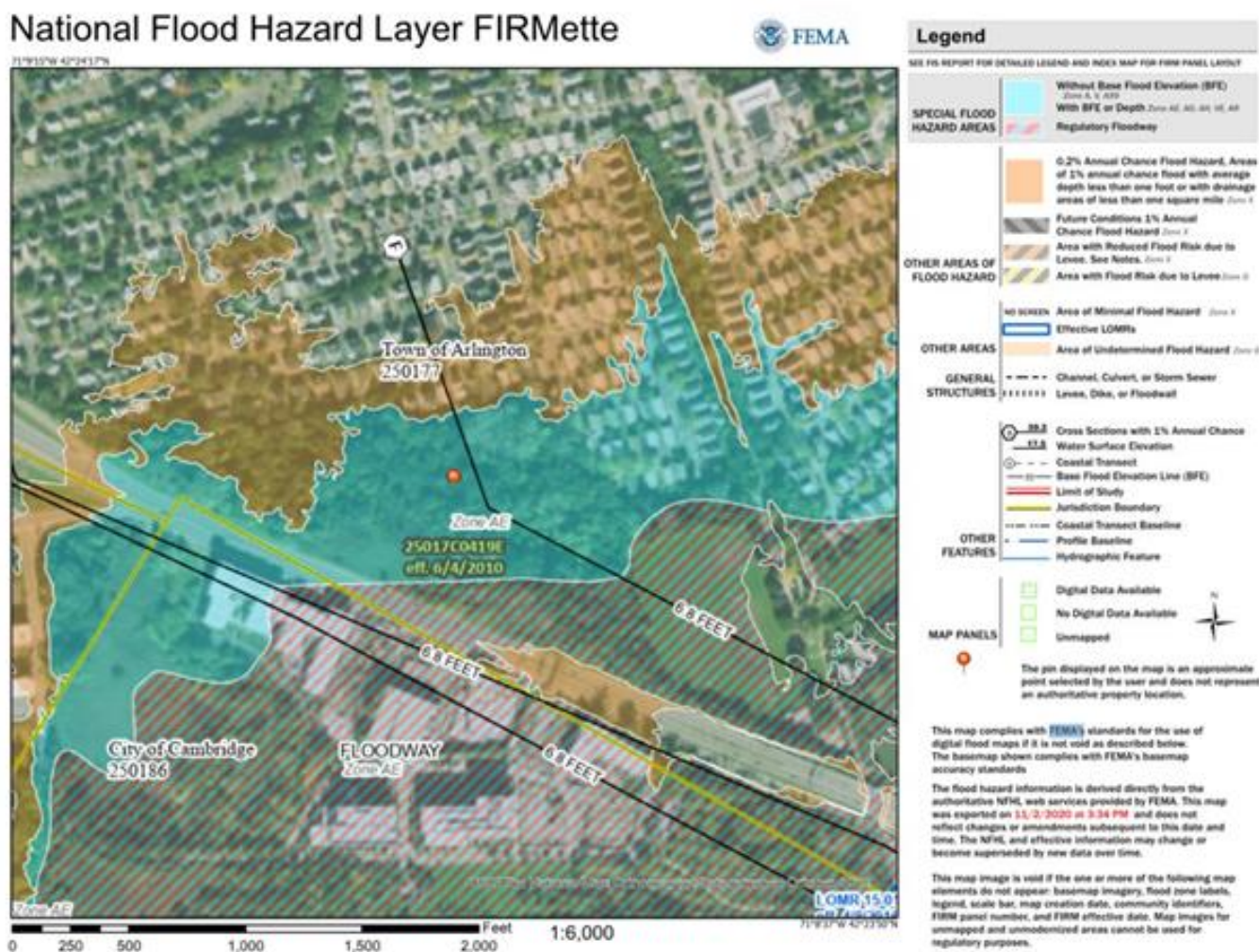


Figure 9. FEMA FIRMette for Site

One factor that FEMA's 100-year BFE does not consider is the effect that SLR and SS are predicted to have on nearby infrastructure such as the Amelia Earhart Dam (AED) in Somerville. This dam affects flood elevations along the Mystic River, Lower Mystic Lake, and Alewife Brook (Little River). According to the Cambridge Climate Change Vulnerability Assessment, which utilizes the Boston Harbor Flood Risk Model (BH-FRM), the AED is likely to be flanked by 2045 and overtopped by 2055. If the AED is flanked and overtopped, it implies that the coastal flooding from the Boston Harbor will affect the

² FEMA, Flood Profiles, Alewife Brook (Little River), p. 11P – 13P.

<https://map1.msc.fema.gov/data/25/S/PDF/25017CV003C.pdf?LOC=78020f32f89217822e61ed46a9aab90e>

proposed development site, and the site is likely to experience a greater than 20% annual probability of flooding by 2070.³ The Department of Conservation and Recreation (DCR) is actively undertaking a Feasibility Analysis on raising and extending the AED and pursuing this effort in coordination with regional resiliency efforts. The timeline for these improvements is uncertain, which is why the Thorndike Place Development should consider these future flooding impacts. Figure 10 shows a map of the 1% annual chance flood depth projected throughout Arlington for 2070 by the BH-FRM, which was the model used in the Cambridge Climate Change Vulnerability Assessment. This map indicates a projected flood depth of at least 10 feet throughout the Mugar site.

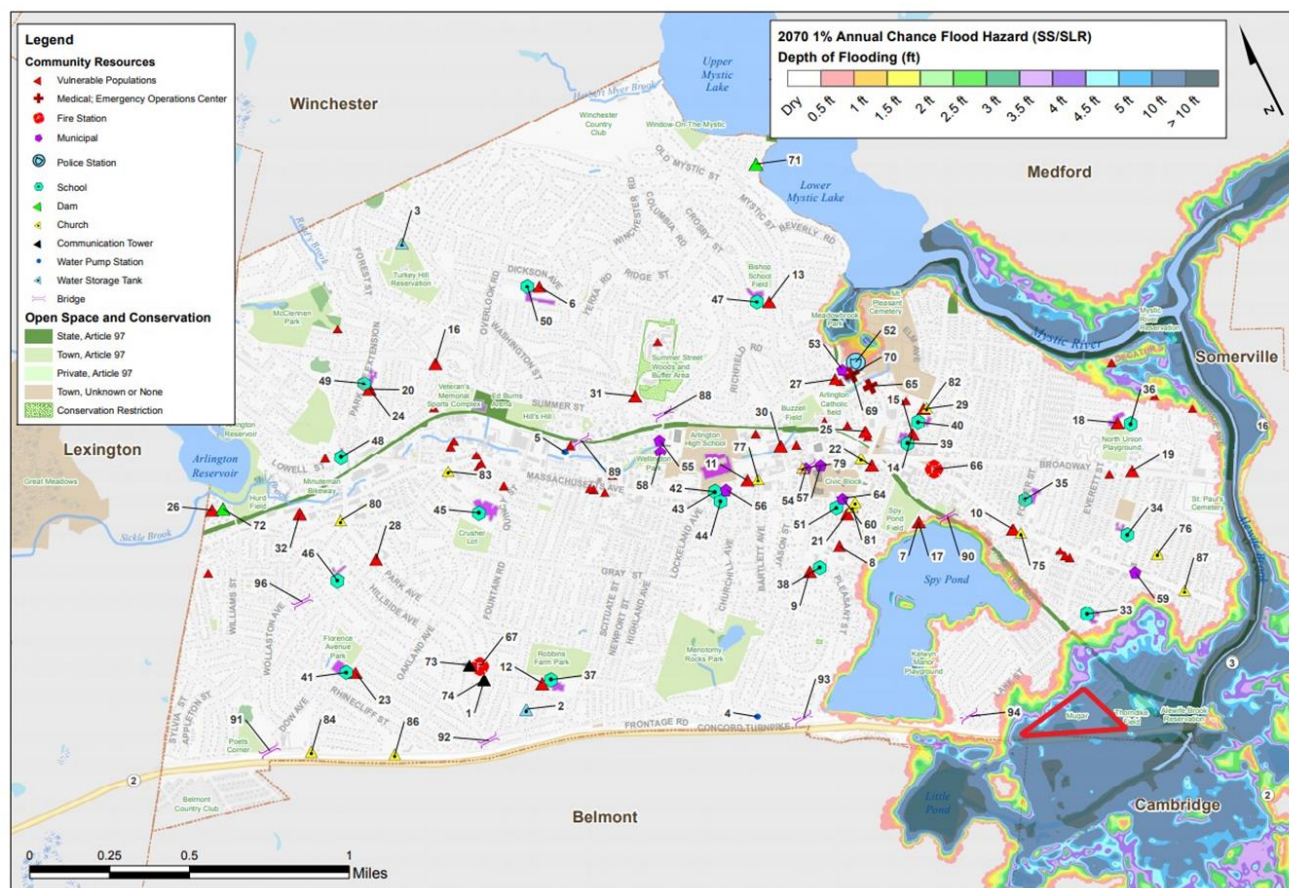


Figure 10. Map from the BH-FRM showing the 2070 1% Annual Chance Flood

Regional coordination is a crucial component of climate resiliency. Coordination and collaboration across communities, State Agencies, and jurisdictions can help strengthen resilient designs and implementation. Similar to Cambridge conducting a Climate Change Vulnerability Assessment, other neighboring communities have taken advantage of updated climate change data in designing new developments. Boston has included coastal flood resilient design that accounts for SLR and SS projections from the BH-FRM developed by the Woods Hole Group for MassDOT. These projections

³ "Climate Change Vulnerability Assessment. Part 2." February 2017. https://www.cambridgema.gov/-/media/Files/CDD/Climate/vulnerabilityassessment/finalreport_ccvapart2_mar2017_final2_web.pdf

are currently being updated as part of the Massachusetts Coastal Flood Risk Model (MC-FRM), which will serve as new design standards for buildings and infrastructure projects across the Commonwealth and will be recommended that cities and towns adopt. Prior to the MC-FRM flood elevations being available, the BH-FRM elevations can serve as a minimal estimate of future projections at the proposed site, as the MC-FRM has consistently projected higher elevations for adjacent areas. Additionally, the City of Cambridge is recommending that all new developments build to the higher of the precipitation or SLR/SS 2070 10-year flood elevation, as well as having the ability to recover from the higher of the precipitation or SLR/SS 2070 100-year flood elevation.

Design Storm Depths

In the November 2020 Stormwater Report, prepared by the BSC Group, design of the stormwater management system was stated to exceed the provisions of the Department of Environmental Protection (DEP) Stormwater Management Standards. HydroCAD Stormwater Modeling Software was used to model the watershed, comparing both pre-development and post-development conditions of the Site. The HydroCAD model analyzed the following recurrence intervals and inches of precipitation over 24 hours, shown in Table 1, below. The design storm depth values that were used for the HydroCAD analysis may meet the rainfall conditions outlined by the current regulatory DEP standards, but they do not accurately consider the increased magnitude of storm events predicted out to the 2070s planning horizon. For example, research on what climate change projections neighboring communities of Cambridge and Boston are using demonstrates that the present-day 100-yr storm event is comparable to the 25-yr storm in 2070.

As discussed in the MassDEP Stormwater Advisory Committee Meeting on September 22, 2020, MassDEP is currently evaluating updating the wetlands regulations to “incorporate the risk observed in the current data to reflect the range of larger observed storms and provide greater resiliency for infrastructure than National Oceanic Atmospheric Administration (NOAA) Atlas 14 design values.”⁴ These updated statewide stormwater standards would include the NOAA Atlas 14 Plus Method for determining design standards for precipitation. The NOAA Atlas 14 Plus Method uses 0.9 times the upper confidence interval of the NOAA Atlas 14 estimate of the 24-hour rainfall depth as a standard for resilient design. MassDEP states that these larger stormwater controls will be better able to accommodate runoff from larger storms and therefore will likely increase the stormwater basin size at most locations.⁵

Expected in early 2021 is the release of the Climate Resilience Design Standards and Guidelines on ResilientMA.org developed by the Resilient MA Action Team (RMAT). Led by the Executive Office of Energy and Environmental Affairs (EEA) and the Massachusetts Emergency Management Agency (MEMA), the RMAT is an interagency steering committee responsible for implementation, monitoring,

⁴ *MassDEP Stormwater Advisory Committee Meeting 3*. September 22, 2020.

<https://www.mass.gov/doc/stormwater-advisory-committee-meeting-3-presentation/download>

⁵ *MassDEP Meeting Summary*. September 22, 2020. <https://www.mass.gov/doc/stormwater-advisory-committee-meeting-3-summary/download>

and maintenance of the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)⁶. These design standards and guidance are for State projects and expected as a resource for MVP projects and other grants. While not regulatory for this project, these standards will be implemented statewide and provide recommendations for design for extreme precipitation.

Climate resilient design for the average level of effort ("Tier 2"), as proposed by the RMAT Standards, include percent increases for NOAA Atlas 14 estimates. These percent increases for the mid-century (2030/2050) and late-century (2070/2090) show greater design storm depths than used for the proposed project. A comparative representation of the precipitation depths discussed in this memorandum is shown in Figure 11, with the corresponding values indicated in Table 1, below. It is recommended that these updated precipitation depths be evaluated within the HydroCAD model to appropriately design a stormwater management system at the Site that will be effective in the 2070s planning horizon.

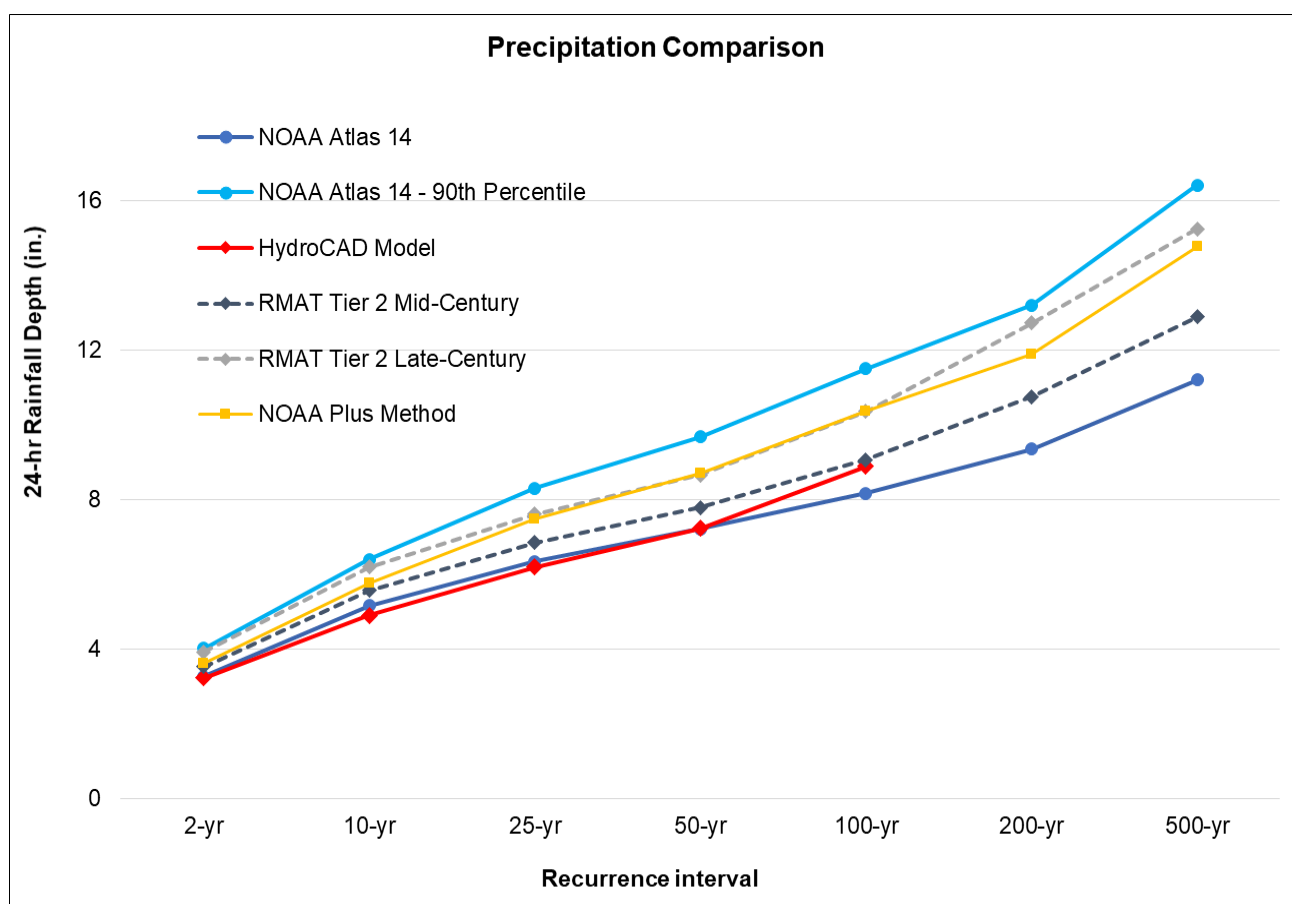


Figure 11. Comparison of Total Storm Depths

⁶ Resilient Massachusetts Action Team (RMAT), 2020. <https://www.mass.gov/info-details/resilient-ma-action-team-rmat>

Table 1. Total Storm Depth (inches/24-hours) comparison across sources and standards.

Recurrence Interval	NOAA Atlas 14 (in/24-hr) ⁷	Values used in the HydroCAD Model (in/24-hr)	NOAA Plus (in/24-hr)	RMAT Tier 2 Mid-Century (in/24-hr)	RMAT Tier 2 Late-Century (in/24-hr)
2-yr	3.27	3.23	3.62	3.53	3.92
10-yr	5.16	4.90	5.76	5.57	6.19
25-yr	6.34	6.20	7.47	6.85	7.61
50-yr	7.21	7.23	8.70	7.79	8.65
100-yr	8.16	8.89	10.35	9.06	10.36
200-yr	9.35	NA	11.88	10.75	12.72
500-yr	11.2	NA	14.76	12.88	15.23

Additional Resilient Design Issues

Deployable Flood Barriers

The BSC Group stated in the December 8, 2020 ZBA Meeting that they had considered projections for extreme precipitation and consequent flooding in 2070 and proposed the use of deployable flood barriers to protect the Site against flood waters. Deployable flood barriers, however, are not recommended for precipitation flooding due to installation time in preparation of the storm event and preliminary cost of retrofitting. There are pre-installation site modifications required for use of these barriers with structural considerations that have not yet been acknowledged or specified by the BSC Group.

Operational capacity is essential for the effectiveness of deployable flood barriers. Example operational considerations include installation needs (time range for deployment, manpower, installation cost, etc.), repair during storm event, retraction needs, storage, and re-use of the products. Furthermore, the use of deployable flood barriers does not consider how barrier protection will impact adjacent properties and affect the stormwater management system design. Please refer to the Boston Public Works Department Climate Resilient Design Standards and Guidelines for Protection of Public Rights-of-Way for further considerations⁸.

⁷ NOAA Atlas 14 Point Precipitation Frequency Estimates.
https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

⁸ *Climate Resilient Design Standards & Guidelines for Protection of Public Rights-of-Way*
https://www.boston.gov/sites/default/files/embed/file/2018-10/climate_resilient_design_standards_and_guidelines_for_protection_of_public_rights-of-way_no_appendices.pdf

Base Flood Elevation

Buildings proposed to be located in any flood hazard area must be designed in accordance with ASCE 24 guidelines⁹. ASCE 24 requires a minimum elevation of the lowest floor as the BFE + 1 foot of freeboard, or the DFE, whichever is higher.

Compensatory Flood Storage Ratio

Provision of a compensatory flood storage ratio of 2 to 1 in southeast quadrant of the Site will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery. More detail into how the 2:1 compensatory storage ratio was achieved should be provided.

Urban Heat Island Effect

Review of available design documents for the Site does not indicate how development will change land surface temperatures or mitigate the already increasing urban heat island effect. Furthermore, the current Site design does not consider or propose methods to mitigate and protect against future projections for extreme heat.

Taken from the Town of Arlington Community Resilience Building 2018 Report, Figure 12 depicts the current heat island analysis for the Arlington area based on land surface temperature¹⁰. This figure demonstrates that the Site is one of limited areas within the Town that has lower land surface temperatures. The Cambridge CCVA further shows that ambient air temperatures are projected to increase through 2070, becoming dangerous to human health, worsening the situation for already vulnerable populations expected to be living on the Site¹¹.

With changes in land cover and removal of existing vegetated species, it is essential to evaluate how extreme heat could be exacerbated or mitigated at the Site. The proposed building footprint is approximately 1.2 acres, not including the paved parking area with 35 parking spots located adjacent to the building.

⁹ <https://ascelibrary.org/doi/book/10.1061/9780784413791>

¹⁰ *Town of Arlington Community Resilience Building Workshop Summary of Findings & Recommendations*. May 2018. <https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-arlington/download>

¹¹ "Climate Change Vulnerability Assessment. Part 1." November 2015. https://www.cambridgema.gov/-/media/Files/CDD/Climate/vulnerabilityassessment/ccvareportpart1/cambridge_november2015_finalweb.pdf

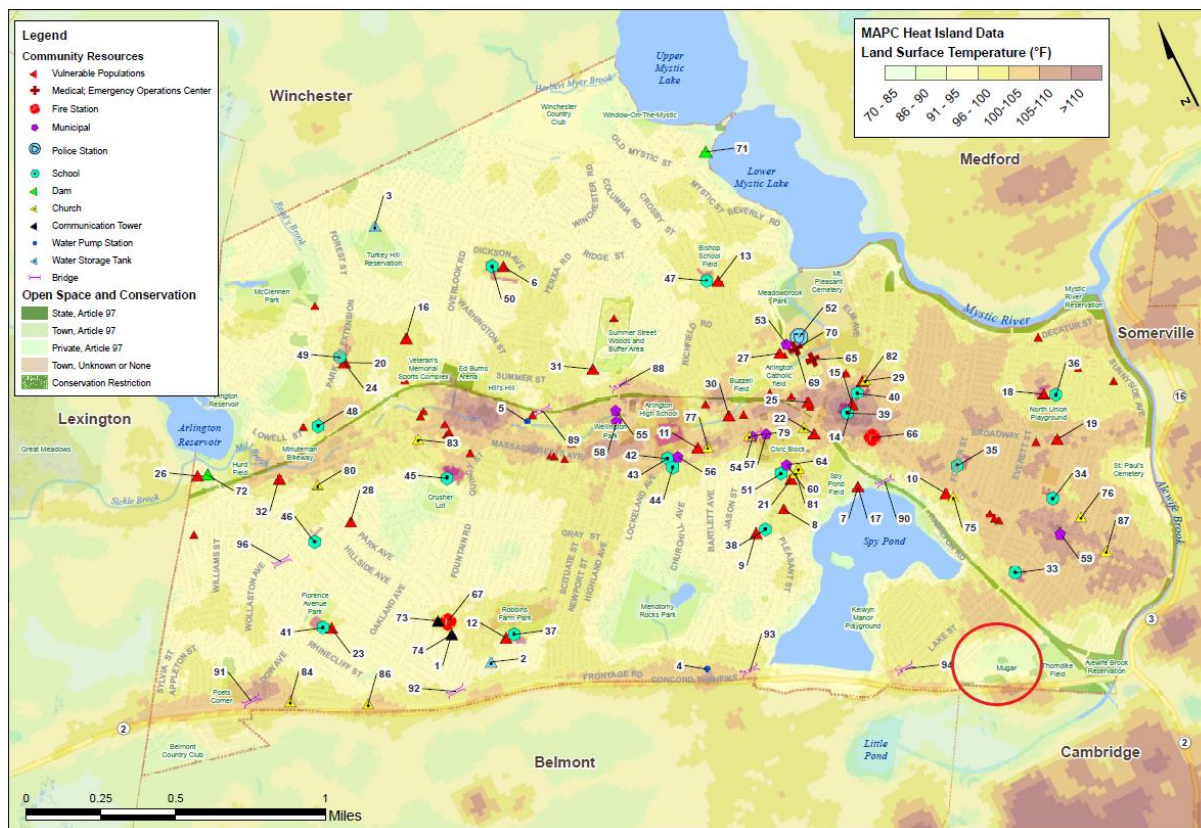


Figure 12. Arlington Land Surface Temperature Map, 2018

Summary of Recommendations

The Town of Arlington has historically experienced extreme flood events and therefore, the design of future developments within the Town should consider increased sea level rise, storm surge, and precipitation projections due to climate change. The Mugar site has previously been used as an area for flood storage, and as such should use extreme caution in development planning. The current design of the Thorndike Place Development does not utilize the best available climate data for this location, and therefore the impacts of the proposed development under future climate scenarios should be assessed. Weston & Sampson Engineers, Inc. provides the following recommendations regarding the design of the Thorndike Place Development:

1. Coordinate to discuss flood elevation findings from Climate Change Vulnerability Assessments conducted by surrounding municipalities and utilize the findings to come up with a DFE that would provide flood protection for the 2070s planning horizon.
2. Utilize updated 24-hr design storm depths in the HydroCAD model to appropriately design a stormwater management system that will be effective in the 2070s planning horizon. The RMA Tier 2 Methodology provides percent increases to the NOAA Atlas 14 design depths used in the current design of the Thorndike development. The efficacy of the proposed stormwater management at the Site should be assessed using the recommended RMA Tier 2 Late Century percent increases.
3. Consider alternative means of flood protection since relying on deployable flood barriers are not recommended for precipitation flooding due to installation time in preparation of the storm event and preliminary cost of retrofitting.
4. Consider how provision of a compensatory flood storage ratio of 2 to 1 in the southeast quadrant of the Site will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery.
5. Provide information on how development of the Site will change land surface temperatures to prevent exacerbating the already increasing urban heat island effect.

Limitations

Weston & Sampson has completed this memorandum for the Arlington Land Trust based on the level of information provided about the project to this date. The opinions presented within the memorandum are not intended for final opinions for construction and will continue to be vetted with future design changes. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this memorandum was prepared. No warranty, expressed or implied, is given.

List of Acronyms

AED – Amelia Earhart Dam

ALT – Arlington Land Trust

BFE – Base Flood Elevation

BH-FRM – Boston Harbor Flood Risk Model

CCVA – Climate Change Vulnerability Assessment

DCR – Department of Conservation and Recreation

DEP – Department of Environmental Protection

DFE – Design Flood Elevation

EOEEA – Executive Office of Energy and Environmental Affairs

FEMA – Federal Emergency Management Agency

MC-FRM – Massachusetts Coastal Flood Risk Model

MEMA – Massachusetts Emergency Management Agency

NOAA – National Oceanic Atmospheric Administration

RMAT – Resilient Massachusetts Action Team

SHMCAP – State Hazard Mitigation and Climate Adaptation Plan

SLR – Sea Level Rise

SS – Storm Surge

ZBA – Zoning Board of Appeals

Glossary

Terms	Description
100-year floodplain	Area with a 1% annual chance of flooding (or 1 in 100 chance) ¹ . Also known as a 1% Annual Exceedance Probability (AEP) flood event (see definition for Annual Exceedance Probability below).
500-year floodplain	Area with a 0.2% annual chance of flooding (or 1 in 500 chance) ¹ . Also known as a 0.2% Annual Exceedance Probability (AEP) flood event (see definition for Annual Exceedance Probability below).
Accommodate	Adaptation strategy that mitigates the potential impact of a hazard by making space for, or buffering, the associated climate condition.
Adaptation	An action that seeks to reduce vulnerability and risk to an anticipated climate impact. For the Tool, this term is focused on the design of physical assets only.
Annual Exceedance Probability (AEP)	Probability of a flood event being equaled or exceeded in a given year.
Base Flood Elevation (BFE)	The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.
Best Practices	Successful activities exemplified in case studies. Available to provide examples for how the Guidelines are best applicable to a project.
Boston Harbor Flood Risk Model (BH-FRM)	A hydrodynamic model created in 2015 to identify projected flood risk and depth from coastal storms and sea level rise.
Climate Change	According to SHMCAP, climate change refers to “a change in the state of the climate that can be identified by statistical changes of its properties that persist for an extended period, whether due to natural variability or as a result of human activity.”
Design Flood Elevation (DFE)	The anticipated flood elevation to which an asset should be designed, to protect the asset.
Design Storm	The magnitude and temporal distribution of precipitation from a storm event defined by probability of occurrence (e.g., five-year storm) and duration (e.g., 24 hours), used in the design and evaluation of stormwater management systems.
Flood Insurance Rate Map (FIRM)	Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community, based on historic information.
Freeboard	Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management.
Risk	According to SHMCAP, risk is defined as “the potential for an unwanted outcome resulting from a hazard event, as determined by its likelihood and associated consequences; and expressed, when possible, in dollar losses. Risk represents potential future losses, based on assessments of probability, severity, and vulnerability.”
Sea level rise (SLR)	The worldwide average rise in mean sea level, which may be due to a number of different causes, such as the thermal expansion of sea water and the addition of water to the oceans from the melting of glaciers, ice caps, and ice sheets; contrast with relative sea-level rise.

Storm Surge (SS)	An abnormal rise in sea level accompanying a hurricane or other intense storm, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone.
Tidal Benchmarks	Tidal datums are standard elevations defined by a certain phase of the tide and are used as reference to measure local water levels. Such datums are referenced to known fixed points called tidal benchmarks.

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Town of Arlington Community Resilience Building Workshop Summary of Findings & Recommendations. May 2018. <https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-arlington/download>

MEMORANDUM – FINAL DRAFT

TO: Arlington Land Trust

FROM: Indrani Ghosh, Resiliency Technical Leader, Weston & Sampson

DATE: January 19, 2021

SUBJECT: Resiliency review consultation services related to the East Arlington Mugar site –
Final DRAFT for review

Weston & Sampson Engineers, Inc. (Weston & Sampson) is pleased to present this memorandum to the Arlington Land Trust to summarize climate resiliency considerations of the Thorndike Place proposed design at the East Arlington Mugar site (the “Site”) being developed by OakTree Development and designed by BSC Group.

Executive Summary

The Arlington Land Trust (ALT) engaged Weston & Sampson to evaluate the climate resiliency of the Thorndike Place design at the East Arlington Mugar site. This was presented through production of talking points for the Zoning Board of Appeals (ZBA) meeting on December 22, 2020 and this memorandum summarizing the review comments. The key considerations described in this memorandum include the following:

1. Use of FEMA Data Compared to Neighboring Communities Standards
 - a. Current design relies solely on regulatory FEMA base flood elevation (Zone AE, 100-yr floodplain, 6.8 ft NAVD88 elevation) and does not consider that the site is also located in the FEMA 500-yr floodplain, nor does it consider the effects of sea level rise and storm surge due to climate change.
 - b. The Amelia Earhart Dam actively affects flood elevations around the site. As reported in the City of Cambridge’s Climate Change Vulnerability Assessment (CCVA), the Boston Harbor Flood Risk Model (BH-FM) shows that the dam will likely be flanked in 2045 and overtopped by 2055. This overtopping or circumventing could cause the flow of water to be reversed, increasing the flood vulnerability of upstream communities.
 - c. Regional coordination is a crucial component of climate resiliency, and neighboring communities of Cambridge and Boston have already considered future flooding for resilient design.

2. Design Storm Depths

- a. The stormwater management system presented by the BSC Group meets current rainfall conditions, but it does not consider the increased magnitude of storm events in the future, such as the climate change projections for the 2070s planning horizon.
- b. Future MassDEP wetlands regulations will likely incorporate the NOAA Plus Method for design storm depth, increasing the stormwater basin design size for most locations.
- c. Future Climate Resilience Design Standards, as developed by the Resilient Massachusetts Action Team (RMAT), include design standards for future extreme precipitation. As demonstrated further in this memorandum, these percent increases in precipitation exceed the design storm depths considered in the proposed design of the Site.

3. Additional Resilient Design Issues:

- a. Deployable flood barriers are not recommended for precipitation flooding due to time needed for deployment and cost of retrofitting.
- b. Buildings proposed to be in any flood hazard area must be designed in Base Flood Elevation + 1 ft of freeboard, or the Design Flood Elevation, whichever is higher according the Massachusetts State Building Code.
- c. Provision of a compensatory flood storage ratio of 2 to 1 will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery.
- d. Site design does not consider or propose methods to mitigate and protect against future projections for extreme heat.

Background

History

The Site is located within a protected wetland in both a FEMA established 100-year floodplain and 500-year floodplain. OakTree Development is utilizing the Chapter 40B statute to seek to bypass the protected wetlands zoning regulations by providing a certain percentage of affordable housing in the Thorndike Place development. These wetlands serve as flood storage, and there is concern that developing on the wetlands will exacerbate an area that has already experienced extreme flooding events in recent decades. Figures 1 through 7 depict scenes after some of these previous extreme storm events. More images and videos of flooding events near the Mugar wetlands can be found at the following link: <https://www.youtube.com/watch?v=1QyLmZv1hAs>



Figure 1. People canoeing down Herbert St. & Lafayette St. after 1996 storm



Figure 2. Flooding on Thorndike St. after 1996 storm



Figure 3. Flooding on Alewife Brook Parkway after 1996 storm



Figure 4. Car submerged on Herbert St. and Lafayette St. after 2001 storm



Figure 5. DPW pumping from Route 2 to into Mugar site wetlands during 2001 storm



Figure 6. Flooding seen on Fairmont St. after 2010 storm



Figure 7. People canoeing at Magnolia Playground after 2010 storm.

Current Design

The planned project will include a 176-unit multi-family housing complex, a percentage of which will be designated as affordable housing. There will be 239 parking spaces, with 204 of these spaces located below ground. The current design of the Thorndike Place development meets regulatory requirements, with a 2 to 1 compensatory flood storage ratio, as well as a design flood elevation (DFE) in accordance with FEMA's 100-year base flood elevation (BFE). The first floor of livable units has a DFE of 13 feet NAVD88, while the DFE of the underground parking garage is unknown. Various stormwater management systems are included in the current design such as a rooftop detention system, a trench drain, a deep sump catch basin, porous asphalt, and deployable flood barriers. A HydroCAD model was used to model the watershed, comparing both pre-development and post-development conditions of the Site. However, the proposed design does not consider sea level rise (SLR), storm surge (SS), and precipitation effects that are very likely to occur during the useful life of the proposed development due to climate change. With the current design of the proposed development, it is likely that the residents who will be inhabiting the planned affordable housing units as well as neighboring Arlington residences may be subject to significant flooding effects when an extreme storm hits.



Figure 8. BSC Group's conceptual site plan, as of September 2020

FEMA Regulations vs. Neighboring Communities

Portions of the Site lie in both the 100-year floodplain and the 500-year floodplain, as established by the Federal Emergency Management Agency (FEMA). Current Massachusetts legislature requires that buildings be designed to the 100-year BFE, which is the elevation that Thorndike Place design relies on at 6.8 feet NAVD88. Although this is the regulatory DFE for Massachusetts developments, FEMA published that, “BFEs reflect estimates of flood risk, but there are many unknown factors that can cause flood heights to rise above the BFE, such as wave action, bridge and culvert openings being blocked by debris, and development in the floodplain. It is important to remember that floods more severe than the 1- percent-annual-chance event can and do occur.”¹ This indicates that designing to the 100-year base flood elevation area may not be enough to prevent flood damage, especially in areas that are prone to flooding. Since the Site is additionally located within the 500-year floodplain, there are further concerns about the current design of the Thorndike Place development. According to flood profiles of

¹ FEMA , *Building Higher in Flood Zones: Freeboard – Reduce Your Risk, Reduce Your Premium*
https://www.fema.gov/media-library-data/1438356606317-d1d037d75640588f45e2168eb9a190ce/FPM_1-pager_Freeboard_Final_06-19-14.pdf

Alewife Brook (Little River)² created by FEMA, the 500-year elevation for the Site is 10.75 feet NAVD88. Furthermore, all of FEMA's elevations for the Site are based on data collected up to June 4, 2010, and do not consider SLR or SS effects due to climate change. The first floor living space for the Thorndike Place development is designed at an elevation of approximately 13 feet-NAVD88, making it suitable for projected SLR and SS effects, but the underground parking area is at a severe risk of flooding.

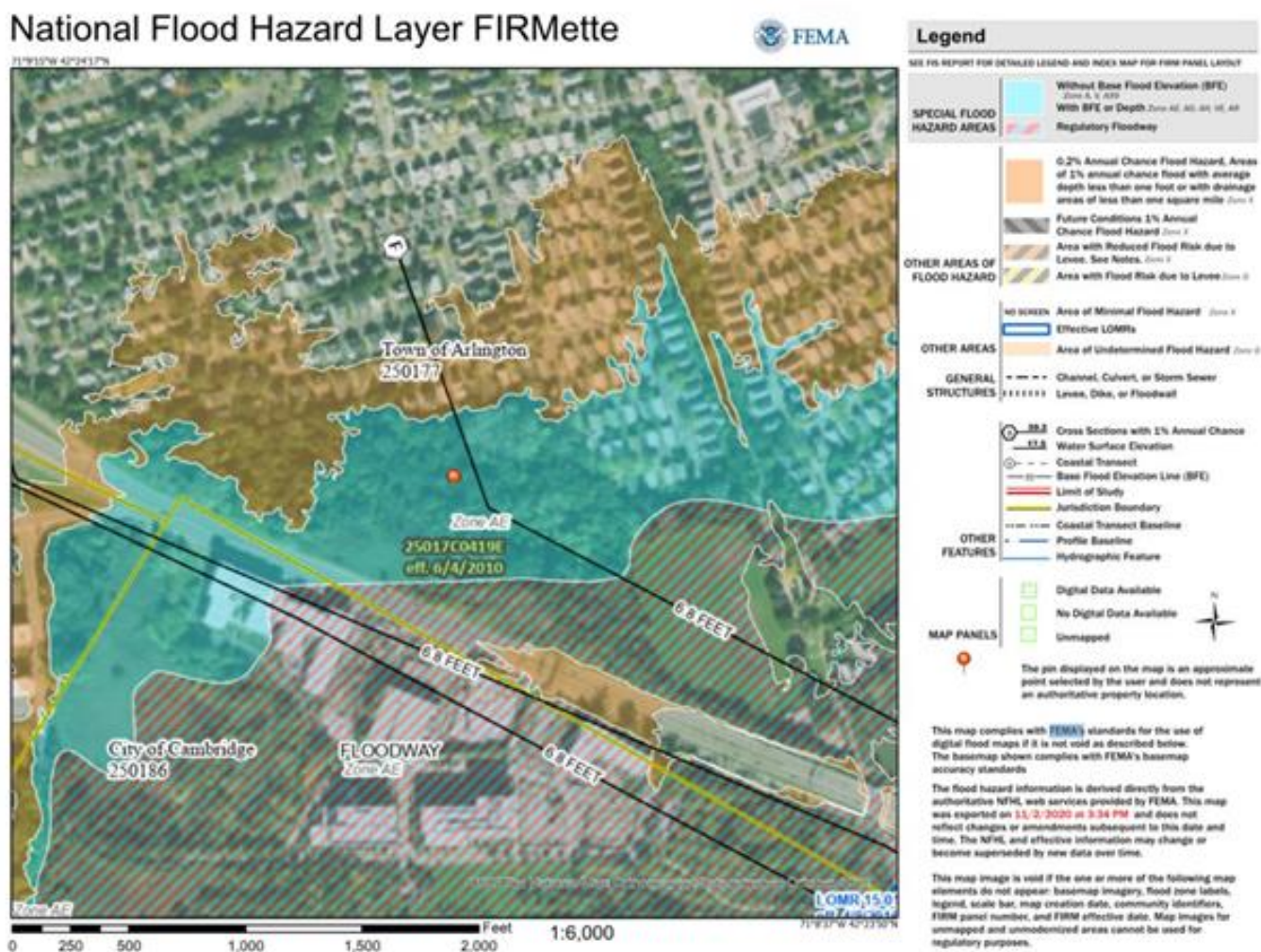


Figure 9. FEMA FIRMeTte for Site

One factor that FEMA's 100-year BFE does not consider is the effect that SLR and SS are predicted to have on nearby infrastructure such as the Amelia Earhart Dam (AED) in Somerville. This dam affects flood elevations along the Mystic River, Lower Mystic Lake, and Alewife Brook (Little River). According to the Cambridge Climate Change Vulnerability Assessment, which utilizes the Boston Harbor Flood Risk Model (BH-FRM), the AED is likely to be flanked by 2045 and overtopped by 2055. If the AED is flanked and overtopped, it implies that the coastal flooding from the Boston Harbor will affect the

² FEMA, Flood Profiles, Alewife Brook (Little River), p. 11P – 13P.

<https://map1.msc.fema.gov/data/25/S/PDF/25017CV003C.pdf?LOC=78020f32f89217822e61ed46a9aab90e>

proposed development site, and the site is likely to experience a greater than 20% annual probability of flooding by 2070.³ The Department of Conservation and Recreation (DCR) is actively undertaking a Feasibility Analysis on raising and extending the AED and pursuing this effort in coordination with regional resiliency efforts. The timeline for these improvements is uncertain, which is why the Thorndike Place Development should consider these future flooding impacts. Figure 10 shows a map of the 1% annual chance flood depth projected throughout Arlington for 2070 by the BH-FRM, which was the model used in the Cambridge Climate Change Vulnerability Assessment. This map indicates a projected flood depth of at least 10 feet throughout the Mugar site.

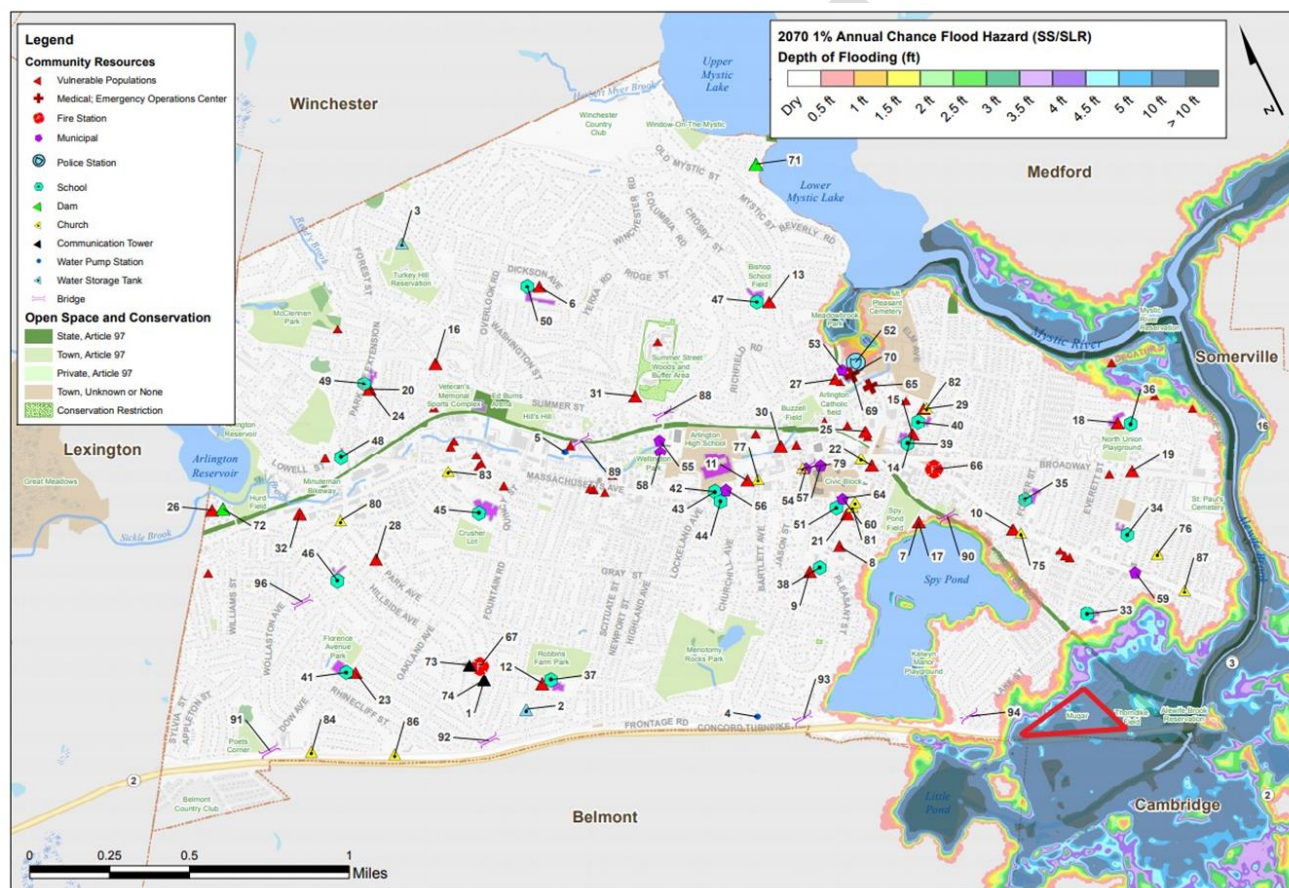


Figure 10. Map from the BH-FRM showing the 2070 1% Annual Chance Flood

Regional coordination is a crucial component of climate resiliency. Coordination and collaboration across communities, State Agencies, and jurisdictions can help strengthen resilient designs and implementation. Similar to Cambridge conducting a Climate Change Vulnerability Assessment, other neighboring communities have taken advantage of updated climate change data in designing new developments. Boston has included coastal flood resilient design that accounts for SLR and SS projections from the BH-FRM developed by the Woods Hole Group for MassDOT. These projections

³ "Climate Change Vulnerability Assessment. Part 2." February 2017. https://www.cambridgema.gov/-/media/Files/CDD/Climate/vulnerabilityassessment/finalreport_ccvapart2_mar2017_final2_web.pdf

are currently being updated as part of the Massachusetts Coastal Flood Risk Model (MC-FRM), which will serve as new design standards for buildings and infrastructure projects across the Commonwealth and will be recommended that cities and towns adopt. Prior to the MC-FRM flood elevations being available, the BH-FRM elevations can serve as a minimal estimate of future projections at the proposed site, as the MC-FRM has consistently projected higher elevations for adjacent areas. Additionally, the City of Cambridge is recommending that all new developments build to the higher of the precipitation or SLR/SS 2070 10-year flood elevation, as well as having the ability to recover from the higher of the precipitation or SLR/SS 2070 100-year flood elevation.

Design Storm Depths

In the November 2020 Stormwater Report, prepared by the BSC Group, design of the stormwater management system was stated to exceed the provisions of the Department of Environmental Protection (DEP) Stormwater Management Standards. HydroCAD Stormwater Modeling Software was used to model the watershed, comparing both pre-development and post-development conditions of the Site. The HydroCAD model analyzed the following recurrence intervals and inches of precipitation over 24 hours, shown in Table 1, below. The design storm depth values that were used for the HydroCAD analysis may meet the rainfall conditions outlined by the current regulatory DEP standards, but they do not accurately consider the increased magnitude of storm events predicted out to the 2070s planning horizon. For example, research on what climate change projections neighboring communities of Cambridge and Boston are using demonstrates that the present-day 100-yr storm event is comparable to the 25-yr storm in 2070.

As discussed in the MassDEP Stormwater Advisory Committee Meeting on September 22, 2020, MassDEP is currently evaluating updating the wetlands regulations to “incorporate the risk observed in the current data to reflect the range of larger observed storms and provide greater resiliency for infrastructure than National Oceanic Atmospheric Administration (NOAA) Atlas 14 design values.”⁴ These updated statewide stormwater standards would include the NOAA Atlas 14 Plus Method for determining design standards for precipitation. The NOAA Atlas 14 Plus Method uses 0.9 times the upper confidence interval of the NOAA Atlas 14 estimate of the 24-hour rainfall depth as a standard for resilient design. MassDEP states that these larger stormwater controls will be better able to accommodate runoff from larger storms and therefore will likely increase the stormwater basin size at most locations.⁵

Expected in early 2021 is the release of the Climate Resilience Design Standards and Guidelines on ResilientMA.org developed by the Resilient MA Action Team (RMAT). Led by the Executive Office of Energy and Environmental Affairs (EEA) and the Massachusetts Emergency Management Agency (MEMA), the RMAT is an interagency steering committee responsible for implementation, monitoring,

⁴ *MassDEP Stormwater Advisory Committee Meeting 3*. September 22, 2020.

<https://www.mass.gov/doc/stormwater-advisory-committee-meeting-3-presentation/download>

⁵ *MassDEP Meeting Summary*. September 22, 2020. <https://www.mass.gov/doc/stormwater-advisory-committee-meeting-3-summary/download>

and maintenance of the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP)⁶. These design standards and guidance are for State projects and expected as a resource for MVP projects and other grants. While not regulatory for this project, these standards will be implemented statewide and provide recommendations for design for extreme precipitation.

Climate resilient design for the average level of effort ("Tier 2"), as proposed by the RMAT Standards, include percent increases for NOAA Atlas 14 estimates. These percent increases for the mid-century (2030/2050) and late-century (2070/2090) show greater design storm depths than used for the proposed project. A comparative representation of the precipitation depths discussed in this memorandum is shown in Figure 11, with the corresponding values indicated in Table 1, below. It is recommended that these updated precipitation depths be evaluated within the HydroCAD model to appropriately design a stormwater management system at the Site that will be effective in the 2070s planning horizon.

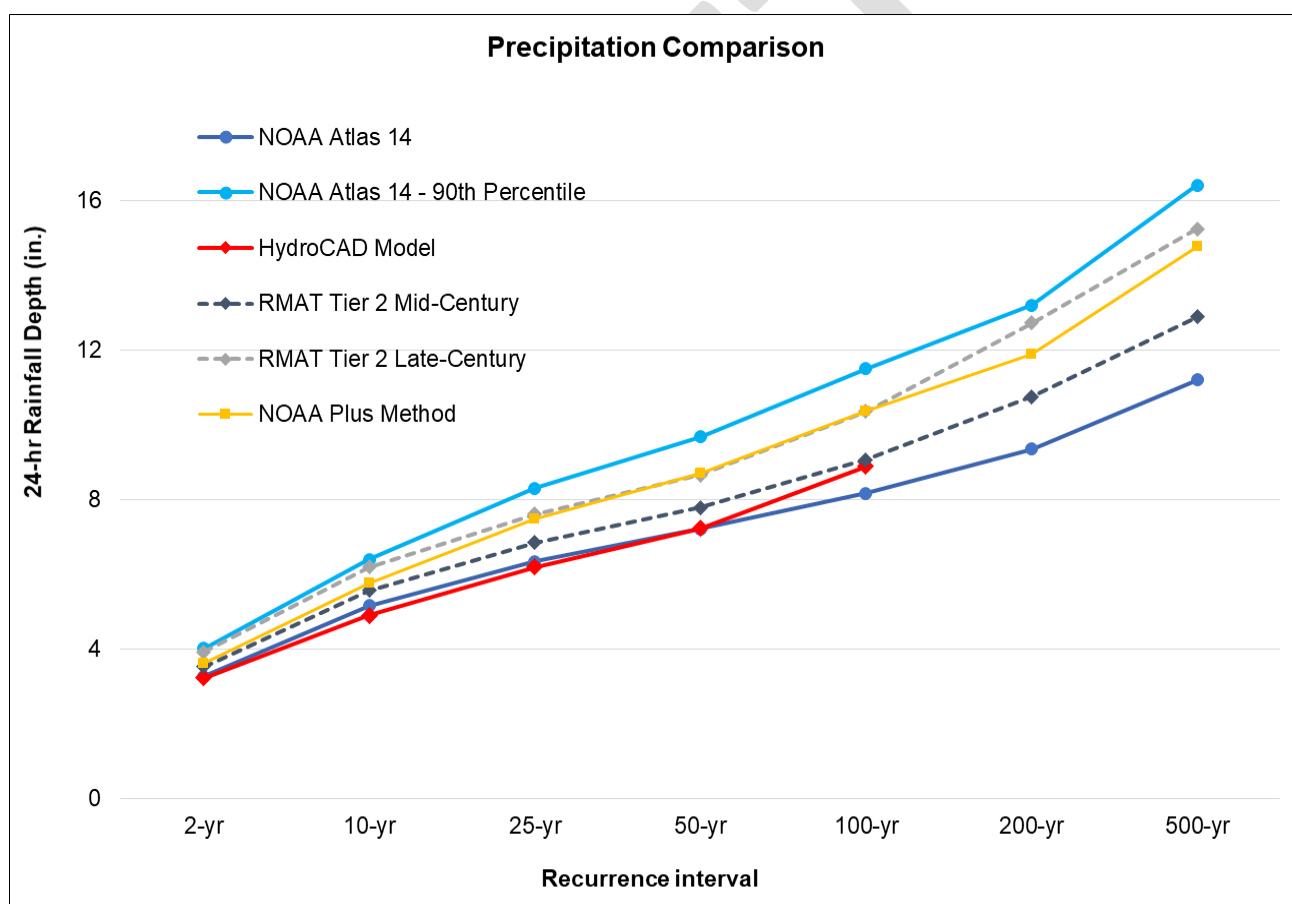


Figure 11. Comparison of Total Storm Depths

⁶ Resilient Massachusetts Action Team (RMAT), 2020. <https://www.mass.gov/info-details/resilient-ma-action-team-rmat>

Table 1. Total Storm Depth (inches/24-hours) comparison across sources and standards.

Recurrence Interval	NOAA Atlas 14 (in/24-hr) ⁷	Values used in the HydroCAD Model (in/24-hr)	NOAA Plus (in/24-hr)	RMAT Tier 2 Mid-Century (in/24-hr)	RMAT Tier 2 Late-Century (in/24-hr)
2-yr	3.27	3.23	3.62	3.53	3.92
10-yr	5.16	4.90	5.76	5.57	6.19
25-yr	6.34	6.20	7.47	6.85	7.61
50-yr	7.21	7.23	8.70	7.79	8.65
100-yr	8.16	8.89	10.35	9.06	10.36
200-yr	9.35	NA	11.88	10.75	12.72
500-yr	11.2	NA	14.76	12.88	15.23

Additional Resilient Design Issues

Deployable Flood Barriers

The BSC Group stated in the December 8, 2020 ZBA Meeting that they had considered projections for extreme precipitation and consequent flooding in 2070 and proposed the use of deployable flood barriers to protect the Site against flood waters. Deployable flood barriers, however, are not recommended for precipitation flooding due to installation time in preparation of the storm event and preliminary cost of retrofitting. There are pre-installation site modifications required for use of these barriers with structural considerations that have not yet been acknowledged or specified by the BSC Group.

Operational capacity is essential for the effectiveness of deployable flood barriers. Example operational considerations include installation needs (time range for deployment, manpower, installation cost, etc.), repair during storm event, retraction needs, storage, and re-use of the products. Furthermore, the use of deployable flood barriers does not consider how barrier protection will impact adjacent properties and affect the stormwater management system design. Please refer to the Boston Public Works Department Climate Resilient Design Standards and Guidelines for Protection of Public Rights-of-Way for further considerations⁸.

⁷ NOAA Atlas 14 Point Precipitation Frequency Estimates.
https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

⁸ *Climate Resilient Design Standards & Guidelines for Protection of Public Rights-of-Way*
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Base Flood Elevation

Buildings proposed to be located in any flood hazard area must be designed in accordance with ASCE 24 guidelines⁹. ASCE 24 requires a minimum elevation of the lowest floor as the BFE + 1 foot of freeboard, or the DFE, whichever is higher.

Compensatory Flood Storage Ratio

Provision of a compensatory flood storage ratio of 2 to 1 in southeast quadrant of the Site will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery. More detail into how the 2:1 compensatory storage ratio was achieved should be provided.

Urban Heat Island Effect

Review of available design documents for the Site does not indicate how development will change land surface temperatures or mitigate the already increasing urban heat island effect. Furthermore, the current Site design does not consider or propose methods to mitigate and protect against future projections for extreme heat.

Taken from the Town of Arlington Community Resilience Building 2018 Report, Figure 12 depicts the current heat island analysis for the Arlington area based on land surface temperature¹⁰. This figure demonstrates that the Site is one of limited areas within the Town that has lower land surface temperatures. The Cambridge CCVA further shows that ambient air temperatures are projected to increase through 2070, becoming dangerous to human health, worsening the situation for already vulnerable populations expected to be living on the Site¹¹.

With changes in land cover and removal of existing vegetated species, it is essential to evaluate how extreme heat could be exacerbated or mitigated at the Site. The proposed building footprint is approximately 1.2 acres, not including the paved parking area with 35 parking spots located adjacent to the building.

⁹ <https://ascelibrary.org/doi/book/10.1061/9780784413791>

¹⁰ *Town of Arlington Community Resilience Building Workshop Summary of Findings & Recommendations*. May 2018. <https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-arlington/download>

¹¹ "Climate Change Vulnerability Assessment. Part 1." November 2015. https://www.cambridgema.gov/-/media/Files/CDD/Climate/vulnerabilityassessment/ccvareportpart1/cambridge_november2015_finalweb.pdf

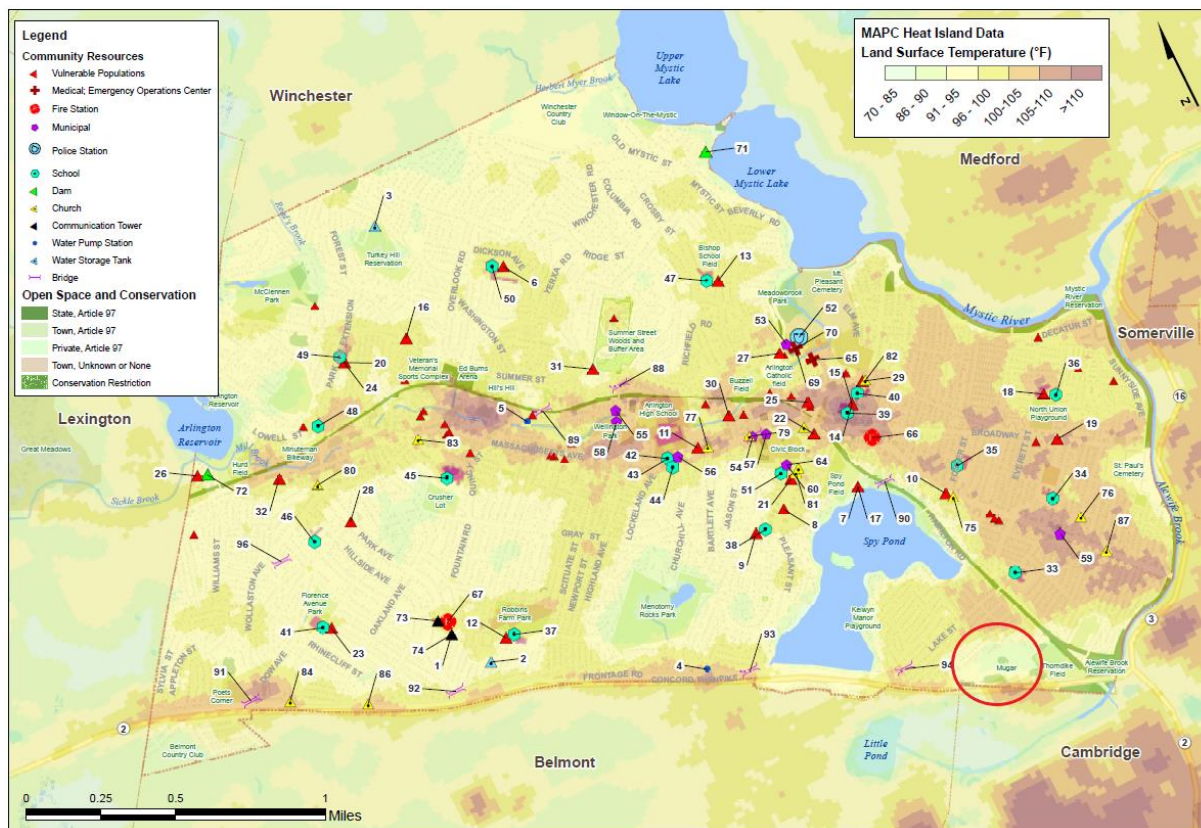


Figure 12. Arlington Land Surface Temperature Map, 2018

Summary of Recommendations

The Town of Arlington has historically experienced extreme flood events and therefore, the design of future developments within the Town should consider increased sea level rise, storm surge, and precipitation projections due to climate change. The Mugar site has previously been used as an area for flood storage, and as such should use extreme caution in development planning. The current design of the Thorndike Place Development does not utilize the best available climate data for this location, and therefore the impacts of the proposed development under future climate scenarios should be assessed. Weston & Sampson Engineers, Inc. provides the following recommendations regarding the design of the Thorndike Place Development:

1. Coordinate to discuss flood elevation findings from Climate Change Vulnerability Assessments conducted by surrounding municipalities and utilize the findings to come up with a DFE that would provide flood protection for the 2070s planning horizon.
2. Utilize updated 24-hr design storm depths in the HydroCAD model to appropriately design a stormwater management system that will be effective in the 2070s planning horizon. The RMA Tier 2 Methodology provides percent increases to the NOAA Atlas 14 design depths used in the current design of the Thorndike development. The efficacy of the proposed stormwater management at the Site should be assessed using the recommended RMA Tier 2 Late Century percent increases.
3. Consider alternative means of flood protection since relying on deployable flood barriers are not recommended for precipitation flooding due to installation time in preparation of the storm event and preliminary cost of retrofitting.
4. Consider how provision of a compensatory flood storage ratio of 2 to 1 in the southeast quadrant of the Site will minimize the area of Bordering Land Subject to Flooding and regrade a portion of the Site, impacting flood recovery.
5. Provide information on how development of the Site will change land surface temperatures to prevent exacerbating the already increasing urban heat island effect.

Limitations

Weston & Sampson has completed this memorandum for the Arlington Land Trust based on the level of information provided about the project to this date. The opinions presented within the memorandum are not intended for final opinions for construction and will continue to be vetted with future design changes. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this memorandum was prepared. No warranty, expressed or implied, is given.

List of Acronyms

AED – Amelia Earhart Dam

ALT – Arlington Land Trust

BFE – Base Flood Elevation

BH-FRM – Boston Harbor Flood Risk Model

CCVA – Climate Change Vulnerability Assessment

DCR – Department of Conservation and Recreation

DEP – Department of Environmental Protection

DFE – Design Flood Elevation

EOEEA – Executive Office of Energy and Environmental Affairs

FEMA – Federal Emergency Management Agency

MC-FRM – Massachusetts Coastal Flood Risk Model

MEMA – Massachusetts Emergency Management Agency

NOAA – National Oceanic Atmospheric Administration

RMAT – Resilient Massachusetts Action Team

SHMCAP – State Hazard Mitigation and Climate Adaptation Plan

SLR – Sea Level Rise

SS – Storm Surge

ZBA – Zoning Board of Appeals

Glossary

Terms	Description
100-year floodplain	Area with a 1% annual chance of flooding (or 1 in 100 chance) ¹ . Also known as a 1% Annual Exceedance Probability (AEP) flood event (see definition for Annual Exceedance Probability below).
500-year floodplain	Area with a 0.2% annual chance of flooding (or 1 in 500 chance) ¹ . Also known as a 0.2% Annual Exceedance Probability (AEP) flood event (see definition for Annual Exceedance Probability below).
Accommodate	Adaptation strategy that mitigates the potential impact of a hazard by making space for, or buffering, the associated climate condition.
Adaptation	An action that seeks to reduce vulnerability and risk to an anticipated climate impact. For the Tool, this term is focused on the design of physical assets only.
Annual Exceedance Probability (AEP)	Probability of a flood event being equaled or exceeded in a given year.
Base Flood Elevation (BFE)	The elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.
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Climate Change	According to SHMCAP, climate change refers to “a change in the state of the climate that can be identified by statistical changes of its properties that persist for an extended period, whether due to natural variability or as a result of human activity.”
Design Flood Elevation (DFE)	The anticipated flood elevation to which an asset should be designed, to protect the asset.
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Flood Insurance Rate Map (FIRM)	Official map of a community on which FEMA has delineated the Special Flood Hazard Areas (SFHAs), the Base Flood Elevations (BFEs), and the risk premium zones applicable to the community, based on historic information.
Freeboard	Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management.
Risk	According to SHMCAP, risk is defined as “the potential for an unwanted outcome resulting from a hazard event, as determined by its likelihood and associated consequences; and expressed, when possible, in dollar losses. Risk represents potential future losses, based on assessments of probability, severity, and vulnerability.”
Sea level rise (SLR)	The worldwide average rise in mean sea level, which may be due to a number of different causes, such as the thermal expansion of sea water and the addition of water to the oceans from the melting of glaciers, ice caps, and ice sheets; contrast with relative sea-level rise.

Storm Surge (SS)	An abnormal rise in sea level accompanying a hurricane or other intense storm, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone.
Tidal Benchmarks	Tidal datums are standard elevations defined by a certain phase of the tide and are used as reference to measure local water levels. Such datums are referenced to known fixed points called tidal benchmarks.

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Town of Arlington Community Resilience Building Workshop Summary of Findings & Recommendations. May 2018. <https://www.mass.gov/doc/2017-2018-mvp-planning-grant-report-arlington/download>

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Town of Arlington, Massachusetts

66-66R Dudley Street Enforcement.

Summary:

66-66R Dudley Street Enforcement.

ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	66R_Dudley_Street_Enforcement_Memo_04252024.pdf	66R Dudley Street Enforcement Memo 04252024.pdf
▢	Reference Material	DRAFT_66R_Dudley_Street_Enforcement_Order_04262024.pdf	DRAFT 66R Dudley Street Enforcement Order 04262024.pdf



TOWN OF ARLINGTON
MASSACHUSETTS
CONSERVATION COMMISSION

To: Arlington Conservation Commission
From: David Morgan, Environmental Planner + Conservation Agent
Department of Planning and Community Development (DPCD)
Date: April 25, 2024
Subject: History of Violations at 66-66R Dudley Street

This memo details facts discovered while investigating the open enforcement order at 66-66R Dudley Street. Numerous violations dating back to at least 2016 were found.

1. Regrading, installation of stockade fence between August 2012 and September 2016
2. Removal of at least 6 trees between October 2017 and November 2020
3. Installation of parking patio between October 2017 and August 2019, adding 100± sq. ft. impervious surface*
4. Installation of second stone patio, adding 650± sq. ft. of impervious surface between November 2020 and December 2022, addition of gravel fill to current grade, installation of garden area and granite edging along Mill Brook bank*
5. Extension of stone wall after December 2022, filling of area behind wall to grade*

All violations were observed within the 200-foot Riverfront Area and 100-foot Buffer Zone and Adjacent Upland Resource Area, including the 25-foot No-Disturbance Area. The three violations noted with an asterisk (*) above also occurred within Bank and Land Subject to Flooding (both floodplain and floodway). Note that, except for #2, all violations listed above involve unpermitted fill in a jurisdictional area.

The Wetlands Protection Act states that unpermitted fill constitutes a continuing violation. The relevant clause is highlighted below. As such, these violations are enforceable today.

No person shall remove, fill, dredge or alter any area subject to protection under this section without the required authorization, or cause, suffer or allow such activity, or leave in place unauthorized fill, or otherwise fail to restore illegally altered land to its original condition, or fail to comply with an enforcement order issued pursuant to this section. **Each day such violation continues shall constitute a separate offense** except that any person who fails to remove unauthorized fill or otherwise fails to restore illegally altered land to its original condition after giving written notification of said violation to the conservation commission and the department shall not be subject to additional penalties

unless said person thereafter fails to comply with an enforcement order or order of conditions.

Whoever violates any provision of this section, (a) shall be punished by a fine of not more than twenty-five thousand dollars or by imprisonment for not more than two years, or both such fine and imprisonment; or (b), shall be subject to a civil penalty not to exceed twenty-five thousand dollars for each violation.

The unpermitted activities at 66-66R Dudley Street have resulted in significant impacts to protected wetland resource areas. Approximately 4,000 sq. ft. of the property have been converted from forested upland to hardpacked gravel, dirt, and patio. An additional 1,500± sq. ft. of the adjoining property have likewise been converted.

I recommend that the Conservation Commission update the existing enforcement order to include the violations listed above.

Enclosures: Google StreetView and field photographs of violations, 2007-2024
Nearmap HERE aerial photographs of 66-66R Dudley Street, 2014-2023

CC: Robert Castelluccio and Salvatore Lorusso, S & R Realty Trust

Arlington, Massachusetts

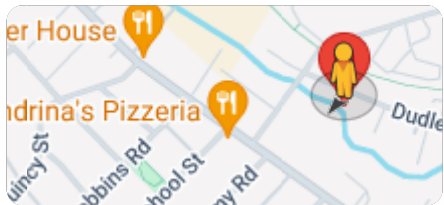
Google Street View

Aug 2007

See latest date



Image capture: Aug 2007 © 2024 Google



Arlington, Massachusetts

Google Street View

Sep 2016 See latest date



Image capture: Sep 2016 © 2024 Google

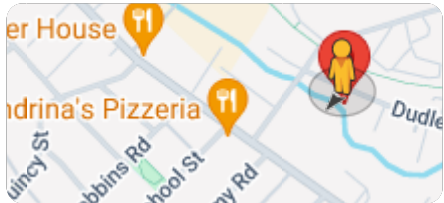
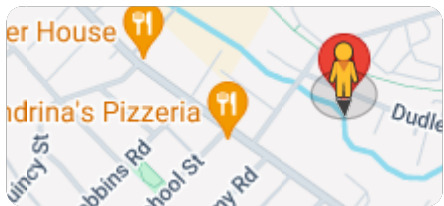




Image capture: Nov 2020 © 2024 Google



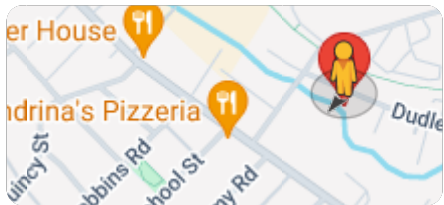


Arlington, Massachusetts

Google Street View

Nov 2020 See latest date

Image capture: Nov 2020 © 2024 Google



Arlington, Massachusetts
Google Street View
Dec 2022 See latest date



Image capture: Dec 2022 © 2024 Google

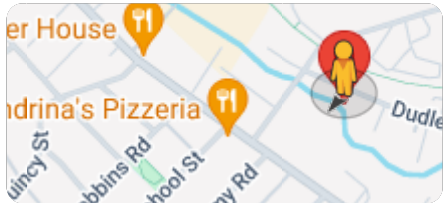
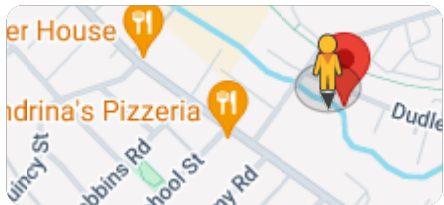




Image capture: Dec 2022 © 2024 Google







Sun Sep 14 2014

Imagery © 2023 Nearmap, HERE

20 ft

130 of 214

nearmap



Wed May 6 2015

Imagery © 2023 Nearmap, HERE

20 ft

131 of 214

nearmap



Sat Mar 19 2016

Imagery © 2023 Nearmap, HERE

20 ft

132 of 214

nearmap



Sat Mar 19 2016

Imagery © 2023 Nearmap, HERE

50 ft

133 of 214

nearmap



Sun Apr 9 2017

Imagery © 2023 Nearmap, HERE

20 ft

134 of 214

nearmap



Mon Apr 9 2018

Imagery © 2023 Nearmap, HERE

20 ft

135 of 214

nearmap



Thu Apr 11 2019

Imagery © 2023 Nearmap, HERE

20 ft

136 of 214

nearmap



Wed Mar 11 2020

Imagery © 2023 Nearmap, HERE

20 ft

137 of 214

nearmap



Sat Mar 27 2021

Imagery © 2023 Nearmap, HERE

20 ft

138 of 214

nearmap



Wed Mar 23 2022

Imagery © 2023 Nearmap, HERE

20 ft

139 of 214

nearmap



Thu Nov 24 2022

Imagery © 2023 Nearmap, HERE

20 ft

140 of 214

nearmap



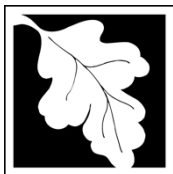
Thu Mar 30 2023

Imagery © 2023 Nearmap, HERE

20 ft

141 of 214

nearmap



DRAFT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number: _____

A. Violation Information

Important:
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



This Enforcement Order is issued by:

Arlington

Conservation Commission (Issuing Authority)

04/26/2024

Date

To:

Robert Castelluccio and Salvatore Lorusso, S & R Realty Trust

Name of Violator

66-66R Dudley Street

Address

1. Location of Violation:

Property Owner (if different)

66-66R Dudley Street

Street Address

Arlington

City/Town

55-2

Assessors Map/Plat Number

02476

Zip Code

30A

Parcel/Lot Number

2. Extent and Type of Activity (if more space is required, please attach a separate sheet):

Unpermitted fill within the 200-foot Riverfront Area and 100-foot Buffer Zone and Adjacent Upland Resource Area, including the 25-foot No-Disturbance Area, as well as within Bank and Land Subject to Flooding (both floodplain and floodway).

B. Findings

The Issuing Authority has determined that the activity described above is in a resource area and/or buffer zone and is in violation of the Wetlands Protection Act (M.G.L. c. 131, § 40) and its Regulations (310 CMR 10.00), because:

- ☒ the activity has been/is being conducted in an area subject to protection under c. 131, § 40 or the buffer zone without approval from the issuing authority (i.e., a valid Order of Conditions or Negative Determination).



DRAFT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number: _____

B. Findings (cont.)

☐ the activity has been/is being conducted in an area subject to protection under c. 131, § 40 or the buffer zone in violation of an issuing authority approval (i.e., valid Order of Conditions or Negative Determination of Applicability) issued to:

Name

Dated

File Number

Condition number(s)

☐ The Order of Conditions expired on (date):

Date

☐ The activity violates provisions of the Certificate of Compliance.

☐ The activity is outside the areas subject to protection under MGL c.131 s.40 and the buffer zone, but has altered an area subject to MGL c.131 s.40.

☐ Other (specify):

C. Order

The issuing authority hereby orders the following (check all that apply):

- ☒ The property owner, his agents, permittees, and all others shall immediately cease and desist from any activity affecting the Buffer Zone and/or resource areas.
- ☒ Resource area alterations resulting from said activity shall be corrected and the resource areas returned to their original condition.

☐ A restoration plan shall be filed with the issuing authority on or before

Date

for the following:

The restoration shall be completed in accordance with the conditions and timetable established by the issuing authority.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DRAFT

DEP File Number: _____

C. Order (cont.)

- ☒ Complete the attached Notice of Intent (NOI). The NOI shall be filed with the Issuing Authority on or before:

06/05/2024

Date

for the following:

Removal of all fill material, replacement of original grade, restoration planting and maintenance plan

No further work shall be performed until a public hearing has been held and an Order of Conditions has been issued to regulate said work.

- ☒ The property owner shall take the following action (e.g., erosion/sedimentation controls) to prevent further violations of the Act:

Install a 12" mulch sock for erosion control at the low point of the site inside of the fence on the bank of Mill Brook. Ensure the sock is maintained and in good condition through April 2024.

Property owner shall attend the June 20, 2024 meeting of the Conservation Commission for further discussion and to report on communications with Mill Brook Condo Association.

Failure to comply with this Order may constitute grounds for additional legal action. Massachusetts General Laws Chapter 131, Section 40 provides: "Whoever violates any provision of this section (a) shall be punished by a fine of not more than twenty-five thousand dollars or by imprisonment for not more than two years, or both, such fine and imprisonment; or (b) shall be subject to a civil penalty not to exceed twenty-five thousand dollars for each violation". Each day or portion thereof of continuing violation shall constitute a separate offense.

D. Appeals/Signatures

An Enforcement Order issued by a Conservation Commission cannot be appealed to the Department of Environmental Protection, but may be filed in Superior Court.

Questions regarding this Enforcement Order should be directed to:

David Morgan

Name

781.316.3012

Phone Number

M/T/W 8 AM - 4 PM, Th 8 AM - 7 PM, F 8 AM - 12 PM

Hours/Days Available

Issued by:

Arlington

Conservation Commission

Conservation Commission signatures required on following page.



DRAFT

D. Appeals/Signatures (cont.)

In a situation regarding immediate action, an Enforcement Order may be signed by a single member or agent of the Commission and ratified by majority of the members at the next scheduled meeting of the Commission.

Signatures:

Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name
Signature	Printed Name

Signature of delivery person or certified mail number



Town of Arlington, Massachusetts

34 Dudley Street Enforcement.

Summary:

34 Dudley Street Enforcement.

ATTACHMENTS:

	Type	File Name	Description
▢	Reference Material	12__25_8__inch_Oak_Stumps.jpg	34 Dudley Street - 12, 25,8, inch Oak Stumps.jpg
▢	Reference Material	38_inch_Oak_Stump.jpg	34 Dudley Street - 12, 25,8, inch Oak Stumps.jpg38 inch Oak Stump.jpg
▢	Reference Material	Enforcement_Order_- _34_Dudley_Street.pdf	Enforcement Order - 34 Dudley Street.pdf







Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

091-0340

A. Violation Information

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



This Enforcement Order is issued by:

Arlington
Conservation Commission (Issuing Authority)

04/25/2024
Date

To:

Jesse Morgan
Name of Violator
530 Oak Court Drive, Suite 115, Memphis TN 38177
Address

1. Location of Violation:

Property Owner (if different)

34 Dudley Street
Street Address

Arlington
City/Town

55

Assessors Map/Plat Number

02476

Zip Code

2-31.B

Parcel/Lot Number

2. Extent and Type of Activity (if more space is required, please attach a separate sheet):

Unpermitted removal of four oak trees from the rear setback of the property, measuring 38", 25", 12", and 18" DBH

B. Findings

The Issuing Authority has determined that the activity described above is in a resource area and/or buffer zone and is in violation of the Wetlands Protection Act (M.G.L. c. 131, § 40) and its Regulations (310 CMR 10.00), because:

☐ the activity has been/is being conducted in an area subject to protection under c. 131, § 40 or the buffer zone without approval from the issuing authority (i.e., a valid Order of Conditions or Negative Determination).



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

091-0340

B. Findings (cont.)

☒ the activity has been/is being conducted in an area subject to protection under c. 131, § 40 or the buffer zone in violation of an issuing authority approval (i.e., valid Order of Conditions or Negative Determination of Applicability) issued to:

Order of Conditions

08/17/2022

Name

Dated

091-0340

13, 14, 46

File Number

Condition number(s)

☐ The Order of Conditions expired on (date):

Date

☐ The activity violates provisions of the Certificate of Compliance.

☐ The activity is outside the areas subject to protection under MGL c.131 s.40 and the buffer zone, but has altered an area subject to MGL c.131 s.40.

☐ Other (specify):

C. Order

The issuing authority hereby orders the following (check all that apply):

- ☐ The property owner, his agents, permittees, and all others shall immediately cease and desist from any activity affecting the Buffer Zone and/or resource areas.
- ☐ Resource area alterations resulting from said activity shall be corrected and the resource areas returned to their original condition.

☒ A restoration plan shall be filed with the issuing authority on or before

05/09/2024

Date

for the following:

Tree planting to replace the four oaks pursuant to the Replacement Standards in the Arlington Bylaw for Wetlands Protection regulations at Section 25.F. If there is insufficient space to meet the standards, the violator shall seek permission to install the trees on adjacent Town-owned property.

The restoration shall be completed in accordance with the conditions and timetable established by the issuing authority.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

091-0340

C. Order (cont.)

- ☐ Complete the attached Notice of Intent (NOI). The NOI shall be filed with the Issuing Authority on or before:

Date

for the following:

No further work shall be performed until a public hearing has been held and an Order of Conditions has been issued to regulate said work.

- ☐ The property owner shall take the following action (e.g., erosion/sedimentation controls) to prevent further violations of the Act:

Failure to comply with this Order may constitute grounds for additional legal action. Massachusetts General Laws Chapter 131, Section 40 provides: "Whoever violates any provision of this section (a) shall be punished by a fine of not more than twenty-five thousand dollars or by imprisonment for not more than two years, or both, such fine and imprisonment; or (b) shall be subject to a civil penalty not to exceed twenty-five thousand dollars for each violation". Each day or portion thereof of continuing violation shall constitute a separate offense.

D. Appeals/Signatures

An Enforcement Order issued by a Conservation Commission cannot be appealed to the Department of Environmental Protection, but may be filed in Superior Court.

Questions regarding this Enforcement Order should be directed to:

David Morgan

Name

781.316.3012

Phone Number

M/T/W 8 AM - 4 PM, Th 8 AM - 7 PM, F 8 AM - 12 PM

Hours/Days Available

Issued by:

Arlington

Conservation Commission

Conservation Commission signatures required on following page.



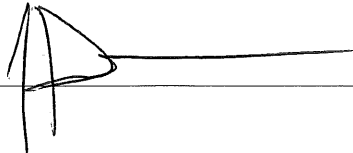
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 9 – Enforcement Order
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

091-0340

D. Appeals/Signatures (cont.)

In a situation regarding immediate action, an Enforcement Order may be signed by a single member or agent of the Commission and ratified by majority of the members at the next scheduled meeting of the Commission.

Signatures:  DAVID MORAHAN Conservation Agent

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature of delivery person or certified mail number



Town of Arlington, Massachusetts

Request for Amendment to DEP #091-0323: Order of Conditions: 869 Massachusetts Avenue (Arlington High School).

Summary:

Request for Amendment to DEP #091-0323: Order of Conditions: 869 Massachusetts Avenue (Arlington High School).

This public hearing will consider an amendment to the Order of Conditions for construction of a new high school building and appurtenances at 869 Massachusetts Avenue within the Riverfront Area, Adjacent Upland Resource Area, and Buffer Zone to Mill Brook.



Town of Arlington, Massachusetts

DEP #091-0323: Extension of Order of Conditions: 869 Massachusetts Avenue (Arlington High School)
(Continued from 4/18/2024).

Summary:

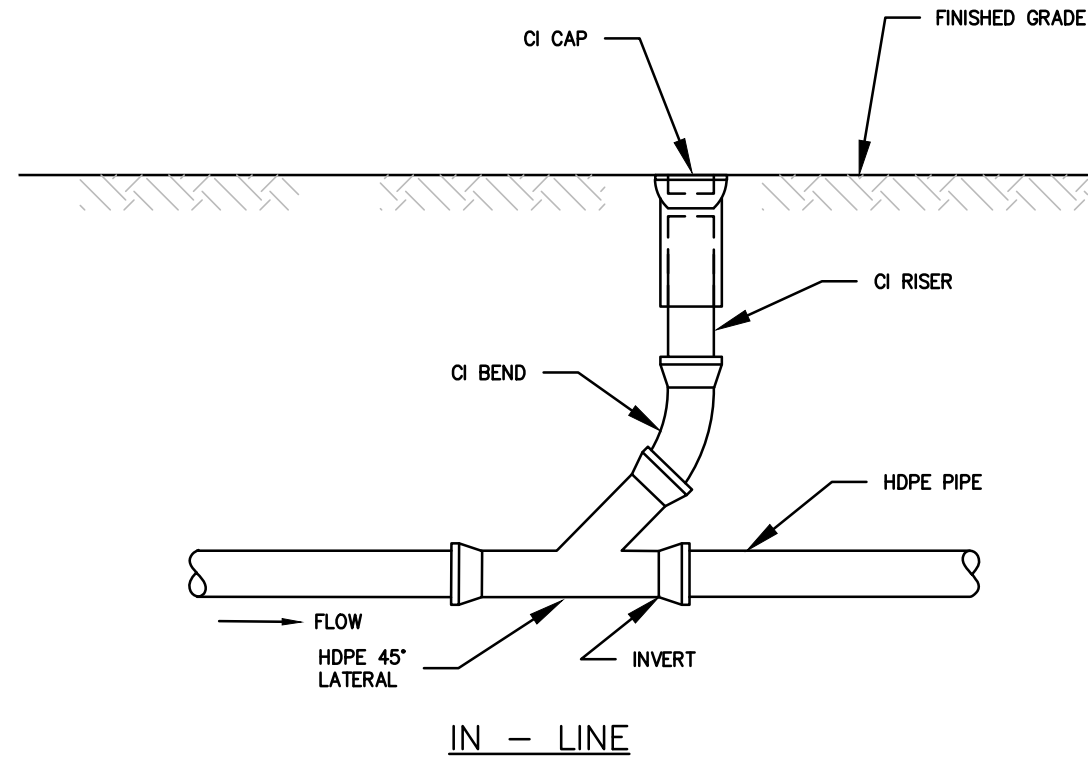
DEP #091-0323: Extension of Order of Conditions: 869 Massachusetts Avenue (Arlington High School)
(Continued from 4/18/2024).

This public hearing will consider an extension of the Order of Conditions for construction of a new high school building and appurtenances at 869 Massachusetts Avenue within the Riverfront Area, Adjacent Upland Resource Area, and Buffer Zone to Mill Brook.

1

NTS

SAMPLING PORT



Samiotes Consultants Inc.
Civil Engineers + Land Surveyors

20 A Street
Framingham, MA 01701

508.877.6688
508.877.8349

www.samiotes.com

samiotes

Arlington High School

SAMPLING PORT DETAIL

869 Massachusetts Ave, Arlington, MA

DRAWING NUMBER

SKC
60

JOB NUMBER

408417

SCALE: NTS

DATE: 04/12/24

DRAWN: CPDL

CHECKED: SRG

April 12, 2024

Charles Tirone, Chair
Arlington Conservation Commission
730 Mass Ave Annex
Arlington, MA 02476

Re: Arlington High School OOC – DEP #091-0323

SCI#: 17211.02

Dear Mr. Tirone,

On behalf of the Arlington High School Building Committee (AHSBC), we would submit a request to amend the existing Order of Conditions (DEP File #091-0323) for the High School Construction project. We request this amendment request be heard at your May 2, 2024 public meeting.

Regarding items discussed at the previous informational meeting on April 4, 2024, the original Order Condition 57 included the Synthetic Turf Infill specifications be submitted and comply with standards outlined in Document #32. Those specifications, Section 321825 Synthetic Field Sport Surfacing and Section 334623 Synthetic Turf Sport Field Drainage And Anchor System of the Project Manual required that the selected manufacturer provide the operation, maintenance manual and maintenance training for their product. That manual is included in this submission based on the selected manufacturer /product now being known to meet the material submitted in the Order.

Based on Condition 56, the AHSBC is now requesting an amendment to the existing Order due to new information being presented regarding a study from California published by the American Chemical Society on the effects of 6PPD-quinone on the coho salmon and other fish. The AHSBC does not believe this study speaks to crumb rubber fields, but rather to the condition resulting tire rubber on roadways. Nonetheless, the AHSBC is proposing to add additional protection and precautions to the project based on this new information. The Applicant proposes to:

1. Add a stormwater filter basket to the turf field's collection basin system. The baskets sit within the originally designed basins per the manufacturer's catalogue (see enclosed cut sheets which lists a 20 x 20 sieve screen for the baskets). They will allow the system to capture sediment (pine needles, crumb rubber, sand, etc.), remove smaller particles at an earlier filtration step, and allow for visual monitoring of the amounts of captured sediment, and facilitate the removal of same from the system for proper disposal. The updated O+M Plan is included with this submission to include monthly inspections the first year, then quarterly maintenance of these baskets after that. These baskets do not meet DEP standards for TSS removal; thus, those calculations are not revised.
2. The AHSBC proposes to install a sampling port within the proposed 12" HDPE line that leaves the eastern-most Turf field drainage system prior to entering DMH-5. This sampling port will be able to be used in the future to sample for 6PPD-quinone after a testing protocol and procedure is established and regulations by either one or both of the US EPA or MA DEP. At that time, the school will monitor for this new chemical (6PPD-qinone) that was not addressed at the time the OOC was issued.

Samiores Consultants, Inc.
Civil Engineers + Land Surveyors

20 A Street
Framingham, MA 01701-4102

T 508.877.6688
F 508.877.8349

www.samiores.com

If you have any questions or concerns, please feel free to contact me at (508) 877-6688, x13 or sgarvin@samiotes.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen Garvin", with a large, sweeping flourish extending from the end of the signature.

Stephen Garvin, PE, LEED AP
President / Principal

Enc.

p:\projects\2017\17211.00 Arlington High Schl\documnts\permitting\con com /17211 AHS OOC amendmnt 4-12-24.doc

**ARLINGTON HIGH SCHOOL
CONSTRUCTION PERIOD POLLUTION PREVENTION PLAN AND EROSION CONTROL
OPERATION AND MAINTENANCE PLAN
MAY 2020 (Amended April 2024)**

During The Construction Period the General Contractor shall be responsible for the following:

1. Erosion Control

Erosion control barriers will be placed along down-gradient portions of the site as indicated on the project plans. Additional erosion control barriers will be placed at the limit of work as needed and in any sensitive areas as work progresses.

A stockpile of additional erosion control barriers shall be kept on site at all times

2. Site Access

Site access for construction equipment will be from Massachusetts Ave. via a construction entrance as shown on the Site Preparation and Demolition Plan, and all construction entrances will be installed at the onset of the project.

3. Construction Staging

A construction staging area will be established by the Contractor.

4. Site Grading/Site Work

The site activities may only commence when the site is stable from erosion and all required control measures are in place and functional.

5. Slope Stabilization

All surfaces and slopes shall be checked at least once every 7 calendar days and within 24 hours of the occurrence of a 24-hour storm event 0.25 inches or greater to see that vegetation is in good condition. Any rills or damage from erosion shall be repaired immediately to avoid further damage. If seeps develop on the slopes, the area will be evaluated to determine if the seep will cause an unstable condition and shall be stabilized immediately if necessary. Problems found during the inspections by the General Contractor shall be repaired promptly. Areas requiring re-vegetation shall be replanted immediately or stabilized in a manner acceptable to the Conservation Commission if it is outside of the growing season. Slopes and other exposed surfaces receiving vegetation will be maintained as necessary to support healthy vegetation. If stabilization is required during the non-growing season, straw mulch, or a commercially manufactured blanket must be employed to prevent erosion.

6. Permanent Stabilization

Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 14 days after the last construction activity. The permanent seed mix, fertilizer, and mulch shall be specified on the project plans. Permanent seeding will occur in the Spring or Fall based on the construction schedule.

7. Drainage Structures (Infiltration Systems, Detention Systems, Catch Basins, Area Drains, Manholes, WQU's, Roof Drains, Filter Baskets)

All structures shall be inspected on a bi-weekly basis and/or after every rain storm and repairs made as necessary. Sediment shall be removed from the sump after the sediment has reached a maximum of one half the depth of the sump. The sediment shall be removed from the site and properly disposed of. Drainage structures/sumps shall be cleaned completely at the end of construction.

Soils within the area of the proposed subsurface infiltration chambers shall be protected throughout construction from compaction from construction vehicles and sedimentation from the adjacent development.

8. Dust and Sediment Control

Siltsacks:

Catch basin/Area drain filters shall be placed at all inlets to drainage structures as structures are installed and prior to pavement removal. Outlet protection work shall be constructed before runoff is allowed to enter the drainage system. Construction and location of catch basin filters shall be as indicated on the Drawings.

Silt Fence with Straw Wattles:

The silt fence with straw wattles shall be installed as indicated on the Drawings.

Wattles shall be placed in a row with ends tightly abutting the adjacent wattles. Each wattle shall be securely anchored in place by stakes spaced 8' apart maximum. The first stake in each wattle shall be angled toward the previously laid wattle to force the wattles together, with a 1'-2' overlap at each junction.

Construction Entrance:

The area of the construction entrance should be cleared of all vegetation, roots, and other objectionable material. The filter fabric should be placed on the subgrade prior to the gravel placement. The gravel shall be placed to the specified dimensions depicted on the plans. The Construction entrance shall be a minimum of 50-feet in length and 24-feet wide.

Temporary Sediment Basins:

Basins shall be provided by the contractor designed to provide storage for either the calculated volume of runoff from a 2-year, 24-hour storm, or 3,600 cubic feet per acre drained. Erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets are required. The contractor shall remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

Dust Control:

A mechanical street sweeper shall be utilized to clean the existing paved areas on an as-needed basis.

Dust control will consist of period road sweeping and watering of site surfaces using a water truck and/or hand watering.

For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.

Pollution Prevention Measures

1. Before, during, and after construction, functional erosion and sedimentation controls shall be implemented to prevent the silting of the wetland areas down-gradient of the site. Straw wattles, silt sacks, crushed stone temporary

stabilization and other controls shall be properly maintained and are not to be removed until the site is permanently stabilized. Other controls shall be added as warranted during construction to protect environmentally-sensitive areas. Sufficient extra materials (e.g. straw wattles and other control materials) shall be stored on site for emergencies.

2. Silt fence shall be installed at all existing and proposed infiltration areas to protect from soils and sediment.
3. Casting of excavated materials shall be stored away from wetland areas and sensitive land areas.
4. Any stockpiling of loose materials shall be properly stabilized to prevent erosion and siltation. Preventative controls such as straw wattles, temporary seeding/mulching and jute covering shall be implemented to prevent such an occurrence.
5. There shall be no flooding, ponding, or flood related damage caused by the project or surface run-off emanating from the project on lands of an abutter, nearby or down-gradient of the site.
6. There shall be no contaminant migration caused by the project to nearby and down-gradient properties, nearby aquifers, and nearby resource areas.
7. The contractor shall make sufficient provisions to control any unexpected drainage and erosion conditions that may arise during construction that may create damage on abutting properties. Said control measures are to be implemented at once.
8. During construction flood prevention, erosion, and sedimentation controls shall be in place before the natural ground cover is disturbed. Said controls shall be in place prior to other construction work and shall be monitored and approved by the Contractor. They shall be properly maintained and are not to be removed until the site is stabilized.
9. The Contractor shall designate a person or persons to inspect and supervise the erosion controls for the project. The Conservation Commission shall be notified as to the means to contact said individual or individuals on a 24-hour basis on all working and non-working days of the project. Said means of contact shall include at least 2 separate telephone number of said designated person or persons.
10. There shall be periodic inspection of straw wattles and other erosion controls by the Contractor's Designee to assure their continued effectiveness.
11. The Contractor shall make adequate provisions for controlling erosion and sediment from activities that might yield water at high volumes with high suspended solid contents, such as dewatering excavations.
12. Street sweeping shall be used to keep public ways free and clear of sediment and dirt from the site activities.

Other Control Measures

Waste Materials. All trash and construction debris from the site will be hauled to an approved landfill or recycling facility. No construction waste material will be buried on the site. All personnel will receive instructions regarding the correct procedure for waste disposal. Notices describing these practices will be posted in the construction office. The site superintendent will be responsible for seeing that these procedures are followed. Employee waste and other loose materials will be collected so as to prevent the release of floatables during rainfall events.

Hazardous Waste. No Hazardous materials are expected to be encountered. The mandated State and Local permits for removal of such materials, if located, will be implemented when such materials are encountered.

After Construction, the owner shall be responsible for the following:

General Land Grading and Slopes Stabilization

All surfaces and slopes shall be checked semi-annually to see that vegetation is in good condition. Any rills or damage from erosion shall be repaired immediately to avoid further damage. If seeps develop on the slopes, the area will be evaluated to determine if the seep will cause an unstable condition and shall be stabilized immediately if necessary. Problems found during the inspections by the Owner shall be repaired promptly. Areas requiring re-vegetation shall be replanted immediately. Slopes and other exposed surfaces receiving vegetation will be maintained as necessary to support healthy vegetation.

Areas of steep slopes (2.5:1 or greater) shall be stabilized using jute mesh or a similar approved erosion blanket.

Erosion Controls

Erosion controls shall not be removed or dismantled without approval from the Engineer or Conservation Commission. Sediment deposits that are removed or left in place after the barriers have been dismantled shall be graded manually to conform to the existing topography and vegetated using seeding or other long term cover as approved in the Landscape Plan. Bare ground that cannot be permanently stabilized within 30 days shall be stabilized by temporary measures.

Street Sweeping (\$500 per sweeping)

It is proposed that the parking and drive areas be swept with a wet brush street sweeper on a semi-annual basis, with at least two sweepings per year. One sweep shall be done at the end of the winter season (prior to the heavy rains), and the other sweep at the end of autumn (prior to snowfall).

Stormwater Management System

Catch Basins, Area Drains, and Drain Manholes (\$500 per structure per inspection/cleaning):

The catch basins, drain manholes, roof drains, and area drains shall be inspected semi-annually, and cleaned out when sumps are approximately one foot full. The use of "clam shells" for sediment removal shall not be allowed; a vacuum truck shall be the approved method of cleaning. Integrity and functionality of oil hoods shall also be checked at the time of the inspection.

Basin Filter Baskets (\$50 per structure per inspection/cleaning):

The infill turf basins filter baskets shall be inspected, emptied (if necessary), and cleaned out on a monthly basis for the first year, then quarterly after that initial year. This sediment should be disposed of in a legal manner outside of any buffer zones or resource areas. Integrity and functionality of baskets shall also be checked at the time of the inspection.

Water Quality Unit (WQU) (\$1,000 per structure per inspection/cleaning):

Water Quality Unit shall be as follows and per manufacturer's recommendations:

- Units should be inspected and cleaned/emptied post-construction, prior to being put into service.
- Inspect every six months for the first year of operation to determine the oil and sediment accumulation rate. In subsequent years, inspections can be based on first-year observations
- Cleaning is required once the sediment depth reaches 15% of storage capacity (generally taking one year or longer).
- Inspect the unit immediately after an oil, fuel, or chemical spill.
- A licensed waste management company should remove captured petroleum waste products from any oil, chemical, or fuel spills and dispose responsibly.

- Owner to follow the requirements of the manufacturer for maintenance and cleaning of the units with a frequency as noted above, and where the requirements of this Operations and Maintenance Plan are more rigorous than manufacturer's requirements, defer to this Operations and Maintenance Plan.

Infiltration and Detention Systems (\$2,500 per system per cleaning; \$350 per system per inspection)

The proposed infiltration system shall be inspected just once per year, and shall follow the suggested schedule for routine maintenance during the regular operation of the stormwater system per the manufacturer's guidelines.

Maintenance and Emergency Repairs

Any maintenance or emergency repairs to the system will be the responsibility of the Owner.

INSPECTION REPORT FORM FOR STORM WATER SYSTEM

Project: Arlington High School – Arlington, MA
 869 Massachusetts Ave, MA

INSPECTOR: _____ DATE: _____

Regular Inspection: ☐

Inspection after Rainfall: ☐ Amount of Rainfall: _____ inches

BMP	Functioning Correctly	Notes/Action Taken
CB-1	Y/N	
CB-2	Y/N	
CB-3	Y/N	
CB-4	Y/N	
CB-10 (WQU)	Y/N	
CB-5 (WQU)	Y/N	
CB-6	Y/N	
CB-7	Y/N	
CB-8	Y/N	
CB-9	Y/N	
CB-10	Y/N	
CB-11	Y/N	

CB-14	Y/N	
AD-1	Y/N	
AD-2	Y/N	
Area Drain – 3	Y/N	
AD-4	Y/N	
AD-5	Y/N	
AD-6	Y/N	
AD-7	Y/N	
AD-13	Y/N	
AD-14	Y/N	
AD-15	Y/N	
WQU-1	Y/N	
DMH-1	Y/N	
DMH-2	Y/N	
DMH-3	Y/N	
DMH-4	Y/N	
DMH-5	Y/N	

DMH-7	Y/N	
DMH-8	Y/N	
DMH-12	Y/N	
DMH-13	Y/N	
DMH-14	Y/N	
DMH-15	Y/N	
DMH-16	Y/N	
DMH-19	Y/N	
DMH-20	Y/N	
DMH-21	Y/N	
DMH-22	Y/N	
DMH-23	Y/N	
DMH-23	Y/N	
DMH-23	Y/N	
DMH-24	Y/N	
DMH-31	Y/N	
DMH-32	Y/N	

OCS	Y/N	
OCS-2	Y/N	
Underground Basin-1	Y/N	
TD-1	Y/N	
TD-2	Y/N	
STDI #BB-05	Y/N	
STDI #SB-08	Y/N	
Basin Filter Baskets	Y/N	

Additional Observations: _____

Action Required: _____

To be performed by: _____ On or Before: _____

Proposed Special Conditions for Monitoring 6PPD-quinone in stormwater discharge from AHS field

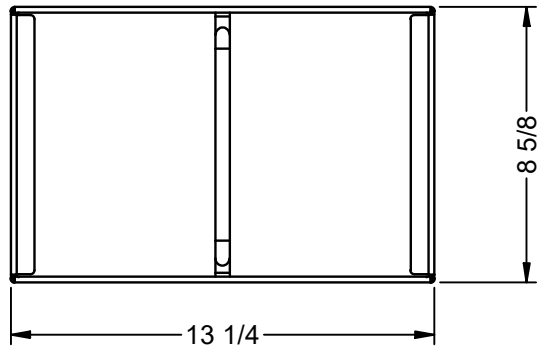
The following Special Conditions are proposed, consistent with Conditions #48 through #50 of the Order of Conditions Mass DEP #344-1233 for the Town of Wilmington Artificial Turf Field; but modified for the chemical 6PPD-quinone. “Mass DEP and the Wilmington Conservation Commission” have been replaced throughout with the “Arlington Conservation Commission or its Agent.” Red text indicate edits; ~~cross-outs~~ indicate removal of text.

1. Prior to work on the artificial turf field, the Applicant shall submit a protocol for testing outflow from under field drainage system to the **Arlington Conservation Commission or its Agent** for review and approval. The protocol shall require sampling, coincident with a significant rain event (greater than 0.25 inches), prior to **field** construction for the purpose of determining a baseline, and on a monthly basis for the first year following installation of the field. The protocol shall require the measurement of concentrations of at least the following analytes: ~~arsenic, barium, cadmium, chromium, lead, mercury, and zinc~~ **6PPD-quinone, using EPA Draft Method 1634. The baseline concentration report shall be submitted to the Arlington Conservation Commission or its Agent for review and approval to establish the baseline concentration of 6PPD-quinone prior to completion of the field installation. If any analytes the concentration of 6PPD-quinone in the post installation sample exceeds MA DEP GW-3 standards either the baseline or the non-detect value (method detection limit), whichever is higher, the Applicant shall notify the Arlington Conservation Commission or its Agent within 24 hours of receipt of the laboratory report, shall immediately institute emergency shut down of the system and submit a plan to the Arlington Conservation Commission for the prompt mitigation of the exceedance. If, after six months of sampling, the results support a reduced sampling frequency, the Arlington Conservation Commission or its Agent may allow upon written request from the Applicant with supporting information that the sampling frequency be reduced to quarterly. After the first year, the Applicant may reduce sampling frequency to quarterly, with at least three rounds collected during the playing season, April through November for the life of the field. After a total of five years of monitoring, the Arlington Conservation Commission or its Agent may allow reduced sampling frequency, upon written request from the Applicant with supporting information, however, at a minimum, sampling must occur annually from there on for the life of the field. This shall be a continuing condition that survives the expiration of this permit/Order and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**
2. In the event that the sampling results exceed the ~~national Ambient Water Quality Criteria or MCP GW-3~~ **established baseline concentration or the method detection limit (EPA draft Method 1634), whichever is greater**, at any time, the Applicant shall evaluate response actions with a goal of restoring background (baseline) levels. Such actions could include replacing the infill material with an alternative infill or replacement of the artificial turf field with natural turf. Such response actions shall be submitted to the **Arlington Conservation Commission or its Agent** for review and approval in the form of a Notice of Intent **or Amendment to the Order of Conditions**, if required by the **Arlington Conservation Commission**, within 60 days of the exceedance. ~~This condition shall remain in perpetuity.~~ **This shall be a continuing condition that survives the expiration of this permit/Order and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**
3. The applicant shall submit **to the Arlington Conservation Commission or its Agent** for review and approval a protocol and plan for monitoring any migration of infill material from the synthetic

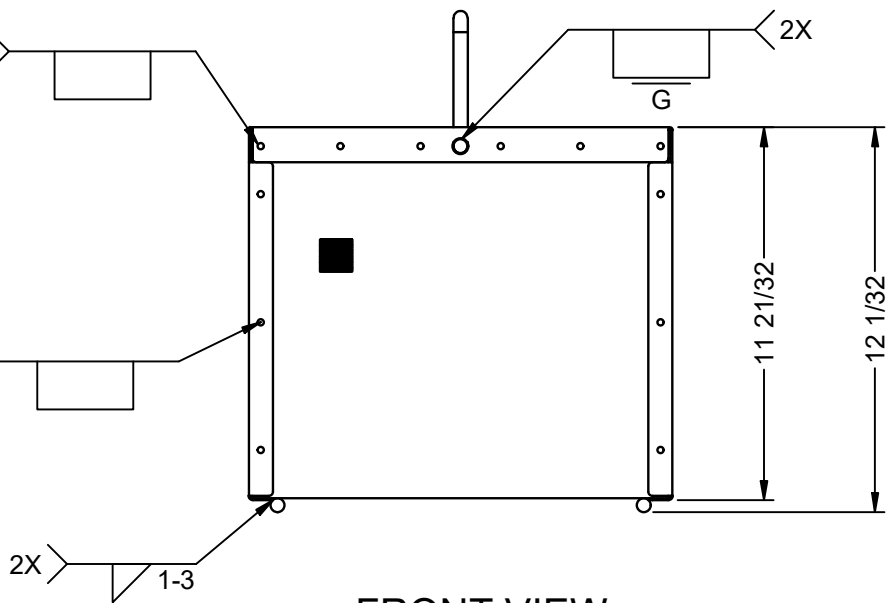
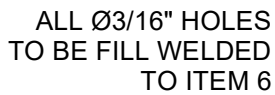
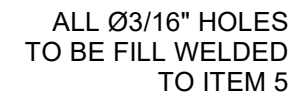
turf field within the 100-foot buffer zone to Mill Brook, also called the Adjacent Upland Resource Area (AURA), which is jurisdictional under the Arlington Bylaw. Such a protocol should include at least three transects from the edge of the field towards/within the AURA with proposed sampling locations. At these locations, soil samples should be sieved and then crumbs point counted. Monitoring shall be done annually at the end of the playing season to determine if the styrene-butadiene rubber ("SBR"), also called tire crumb rubber, does migrate from the site towards or into the AURA. Additional sampling points shall be added in the event SBR crumbs (tire crumb rubber) are detected at the farthest sampling point from the field until SBR (tire crumb rubber) is detected. Monitoring for SBR crumbs (tire crumb rubber) may be suspended after three years with the approval of the Arlington Conservation Commission or its Agent upon written request from the Applicant documenting that there has been no SBR (tire crumb rubber) migration from the field. This shall be a continuing condition that survives the expiration of this permit/Order and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.

The Applicant should note that Special Condition #56 in the OOC may require, in the future, that additional chemicals be monitored from the stormwater drainage system because it states that:

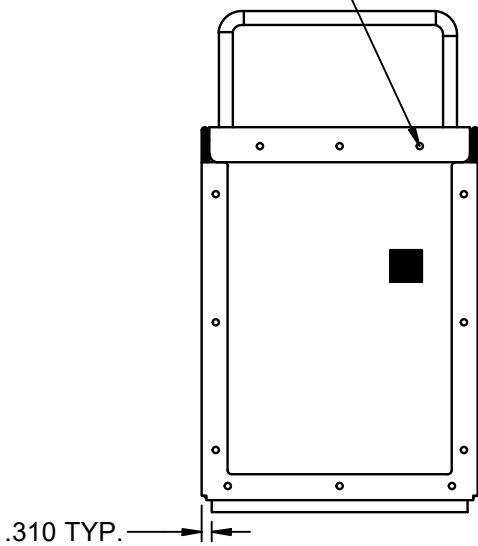
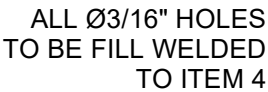
"The Applicant is responsible for informing the Conservation Commission of any updated state or federal standards for artificial turf that relate to environmental impact, and water quality monitoring of stormwater or groundwater in a timely manner to the best of their knowledge. **This shall be a continuing condition that survives the expiration of this permit/Order and shall be included in any Certificate of Compliance as a continuing condition in perpetuity.**"



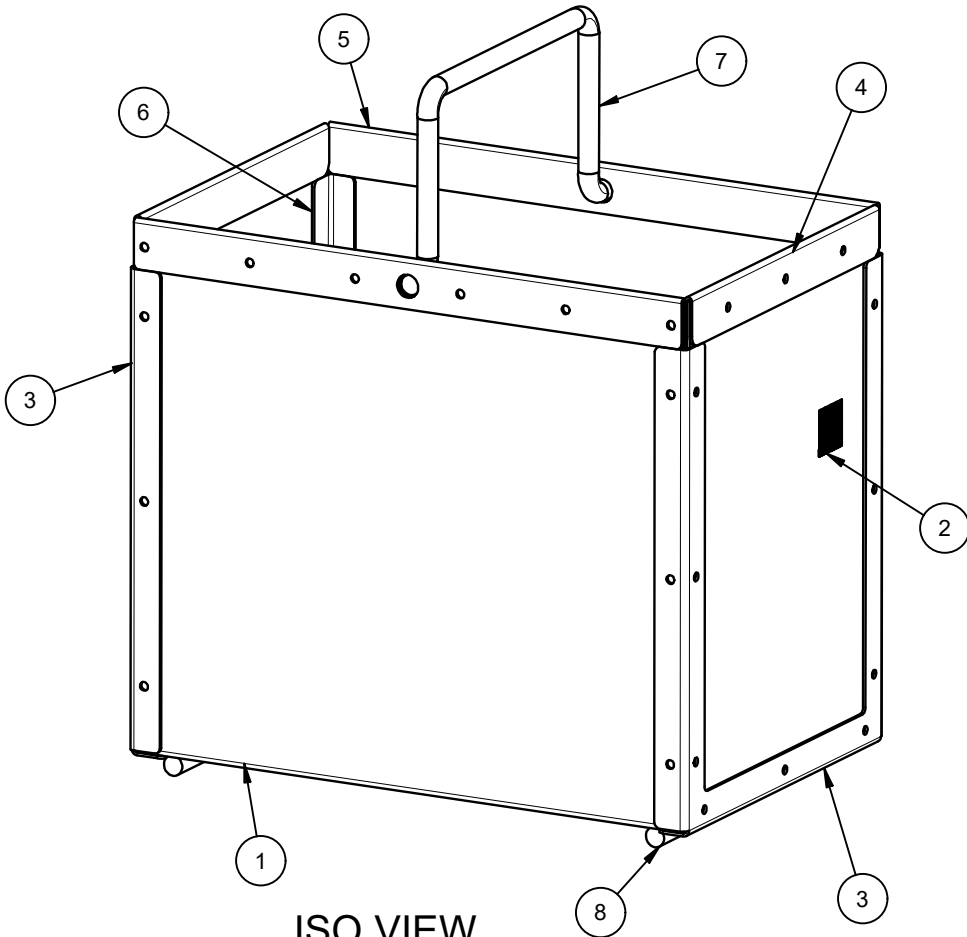
TOP VIEW
SCALE 1/6



FRONT VIEW
SCALE 1/6



RIGHT VIEW
SCALE 1/6




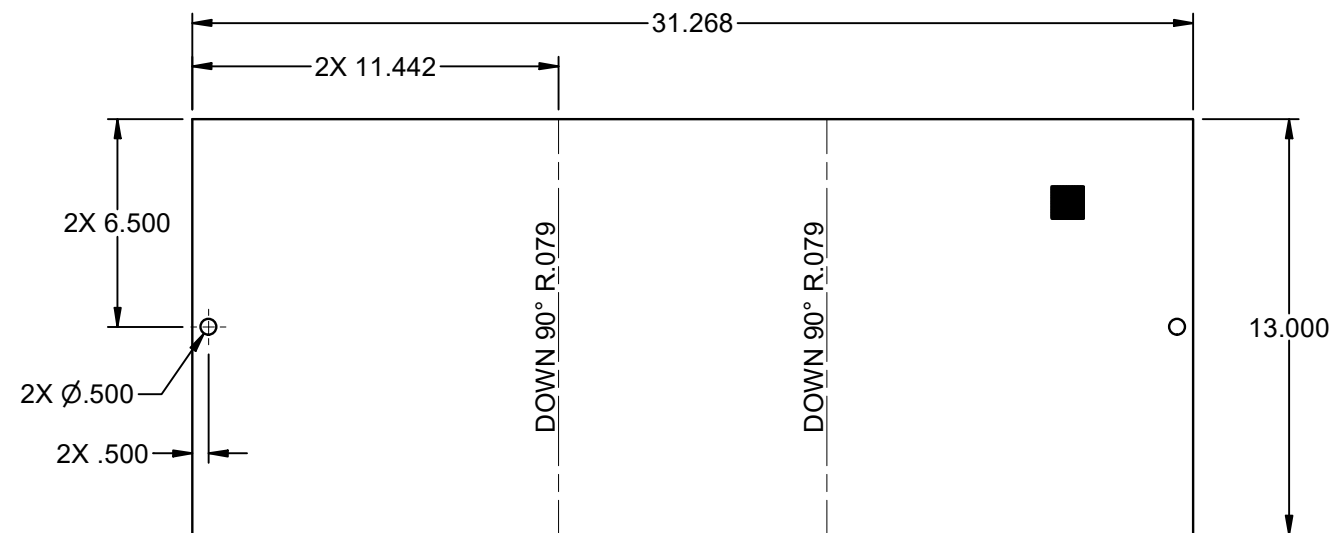
ISO VIEW
N.T.S.

BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	MATERIAL	WEIGHT (Lb)
1	1	Wire Cloth, 20 x 20, Ø0.023" Wire	Stainless Steel AISI 304	7.0
2	2	Wire Cloth, 20 x 20, Ø0.023" Wire	Stainless Steel AISI 304	1.7
3	2	Sheet, 16 Gauge	Stainless Steel AISI 304	0.7
4	2	Sheet, 16 Gauge	Stainless Steel AISI 304	0.0
5	2	Sheet, 16 Gauge	Stainless Steel AISI 304	0.5
6	2	Sheet, 16 Gauge	Stainless Steel AISI 304	0.6
7	1	Round Bar, Ø7/16	Stainless Steel AISI 304	0.7
8	2	Round Bar, Ø7/16	Stainless Steel AISI 304	0.3

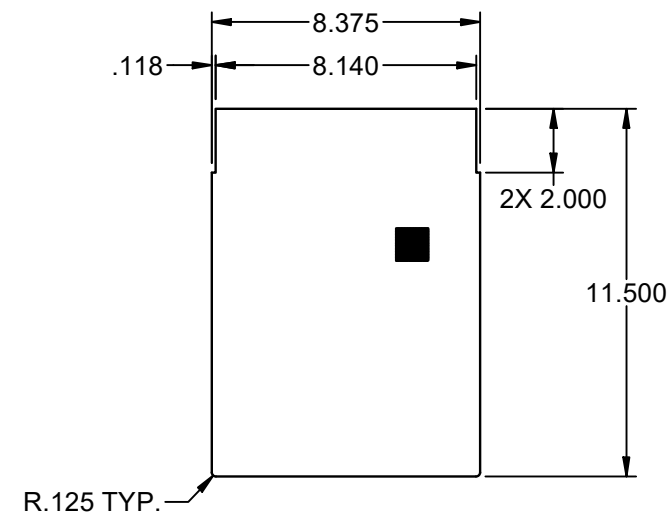
NOTES (UNLESS OTHERWISE SPECIFIED):

1. DIMENSIONS IN INCHES. DUAL DIMENSIONS IN MM MAY BE SHOWN IN BRACKETS FOR REFERENCE ONLY
2. TOLERANCES: FRACTIONAL (X/X) \pm 1/8; TWO PLACE (0.00) \pm .06; THREE PLACE (0.000) \pm .015; ANGULAR \pm 1°
3. ALL FEATURES ARE SQUARE, SYMMETRICAL, AND TYPICAL UNLESS NOTED OTHERWISE
4. REMOVE ALL BURRS AND SHARP EDGES. CLEAN UP WELD SPLATTER WHERE APPLICABLE
5. FINISH: NONE
- 169 of 214

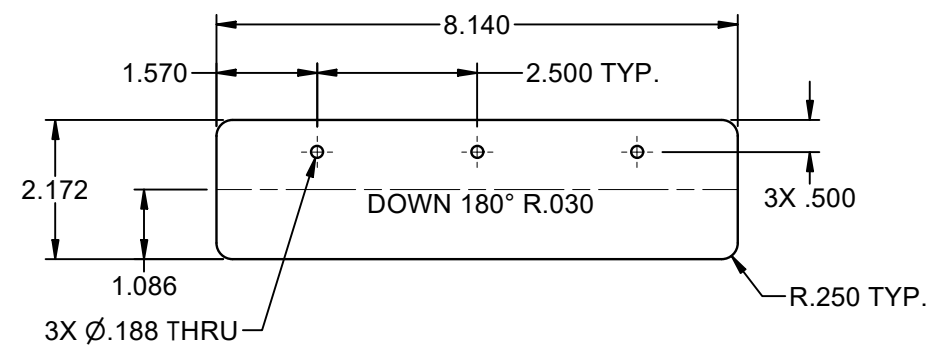
P0	PRELIMINARY RELEASE	JCS	--	2/28/2024
REV	COMMENTS	BY	CHKD	DATE
 <p>P.O. BOX 837 / 259 MURDOCK ROAD TROUTMAN, NC 28166 (704) 528-9806 (800) 438-6057 www.abtdrains.com</p>	<p>FABRICATION DRAWING © 2024 ABT, Inc.</p> <p>XT8 - 610 TRASH BASKET</p> <p>20X20 MESH</p>			
	<p>FILE: SE.TTB01-P0</p>	<p>PART: SE.TTB01</p>		
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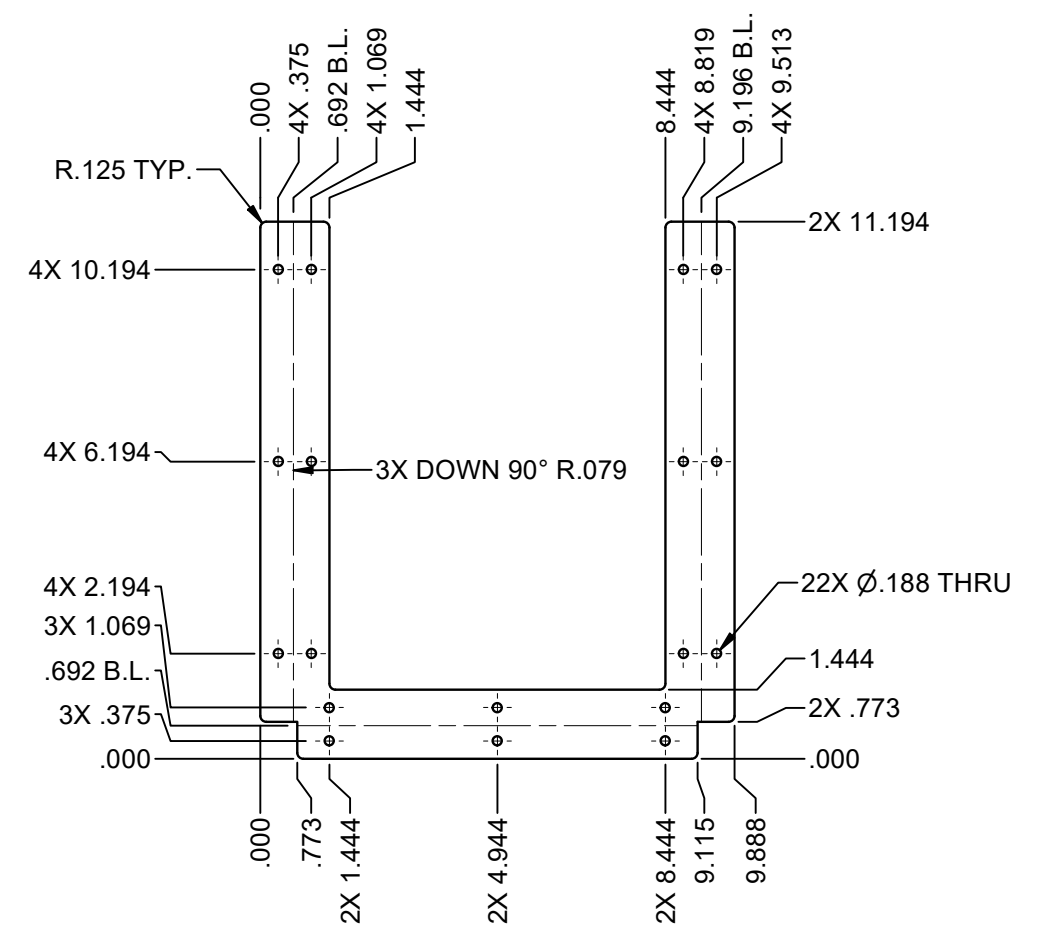
ITEM 1 FLAT PATTERN
SCALE 1/6



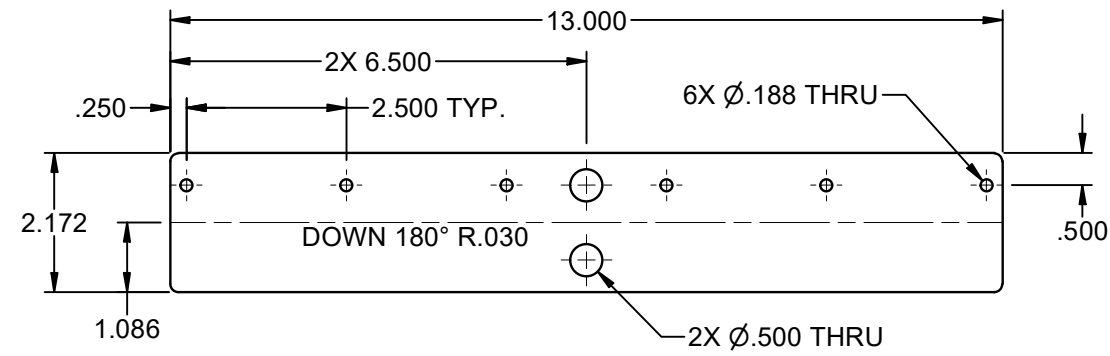
ITEM 2 FRONT VIEW
SCALE 1/6



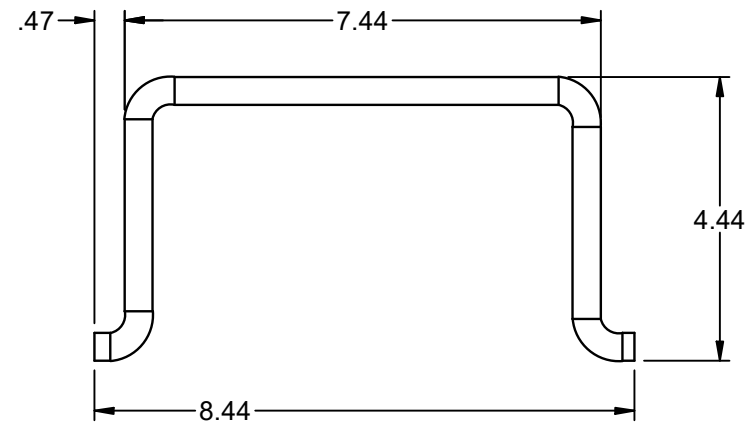
ITEM 4 FLAT PATTERN
SCALE 1/3



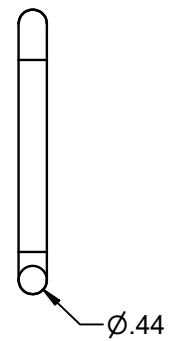
ITEM 3 FLAT PATTERN
SCALE 1/4



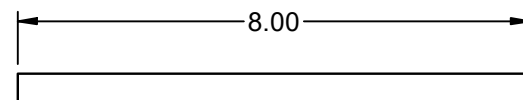
ITEM 5 FLAT PATTERN
SCALE 1/3



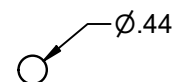
ITEM 7 FRONT VIEW
SCALE 1/3



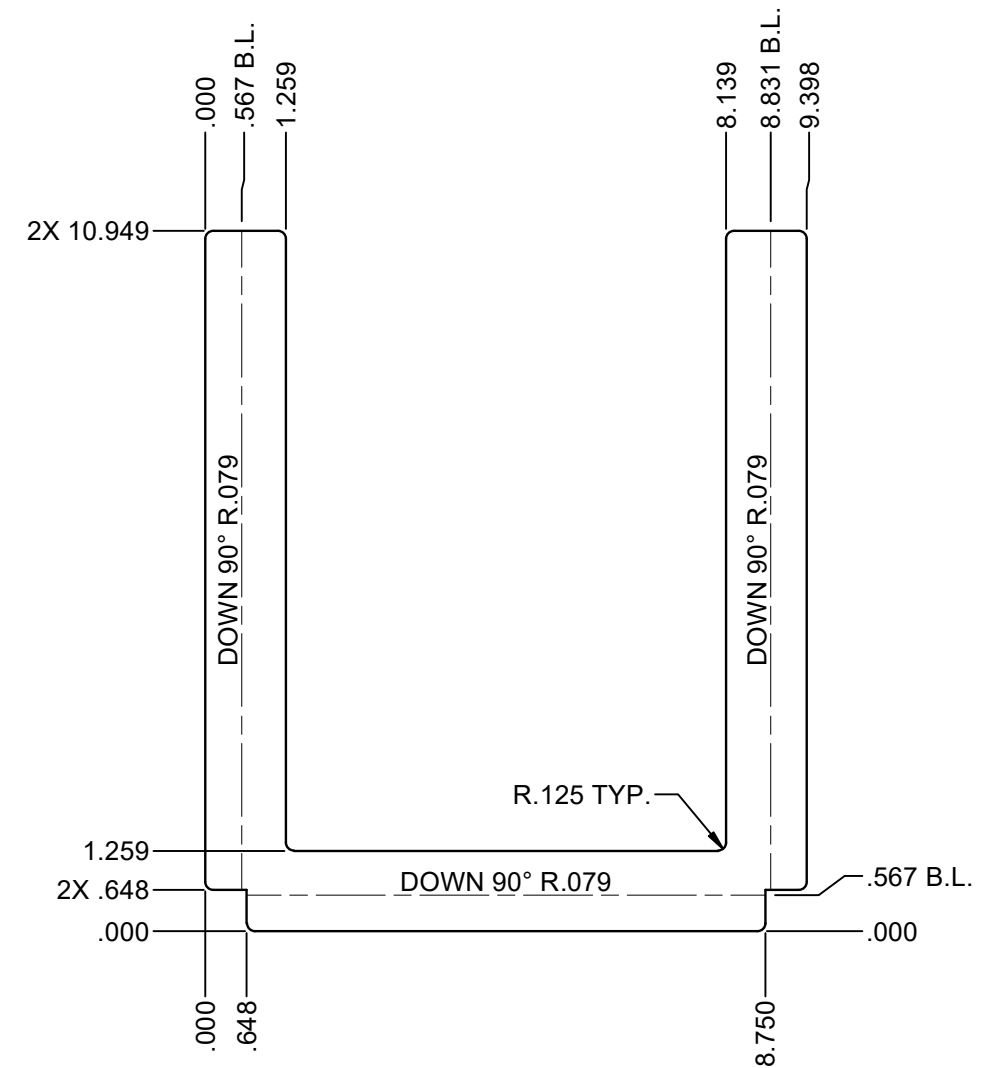
ITEM 7 RIGHT VIEW
SCALE 1/3



ITEM 8 FRONT VIEW
SCALE 1/3

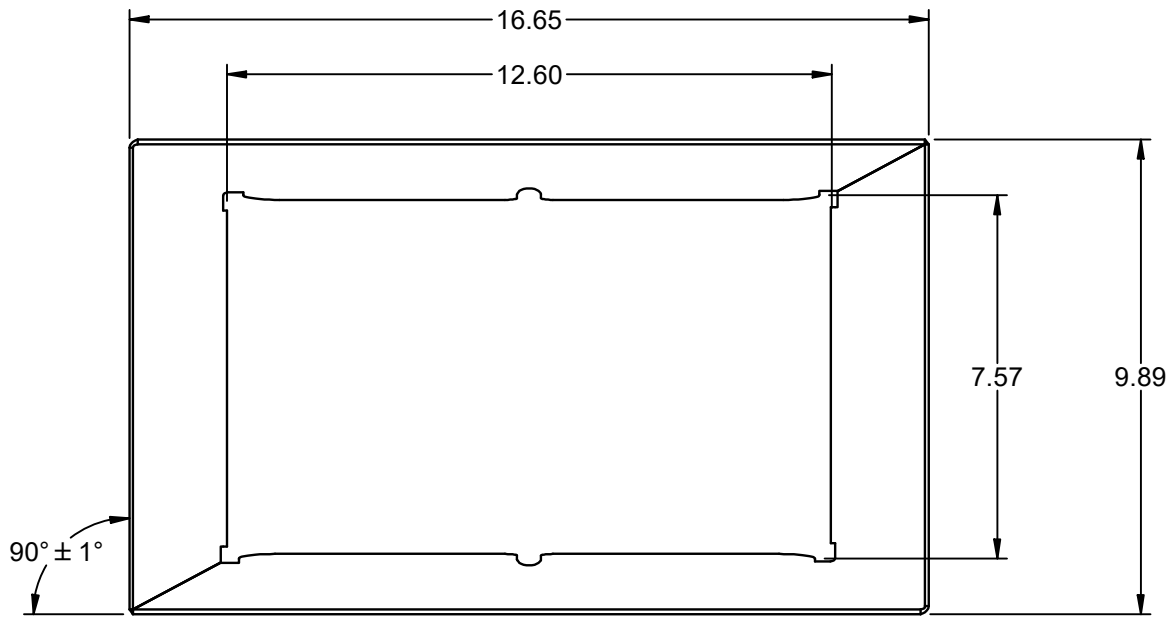


ITEM 8 RIGHT VIEW
SCALE 1/3

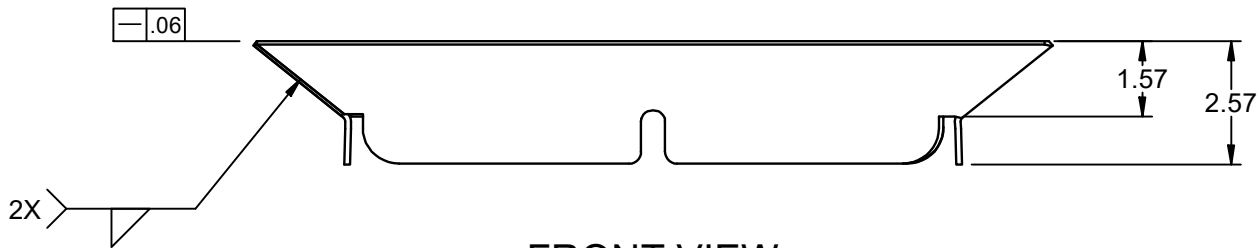


ITEM 6 FLAT PATTERN
SCALE 1/3

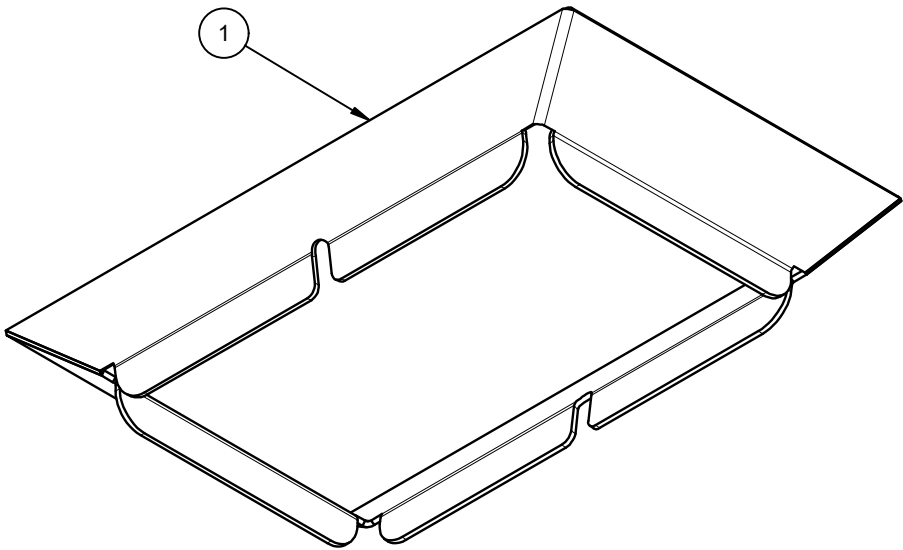
BILL OF MATERIAL				
ITEM	QTY	DESCRIPTION	MATERIAL	WEIGHT (Lb)
1	2	Sheet, 11 GA	Stainless Steel AISI 304	2.3



TOP VIEW
SCALE 1 / 4




FRONT VIEW
SCALE 1 / 4

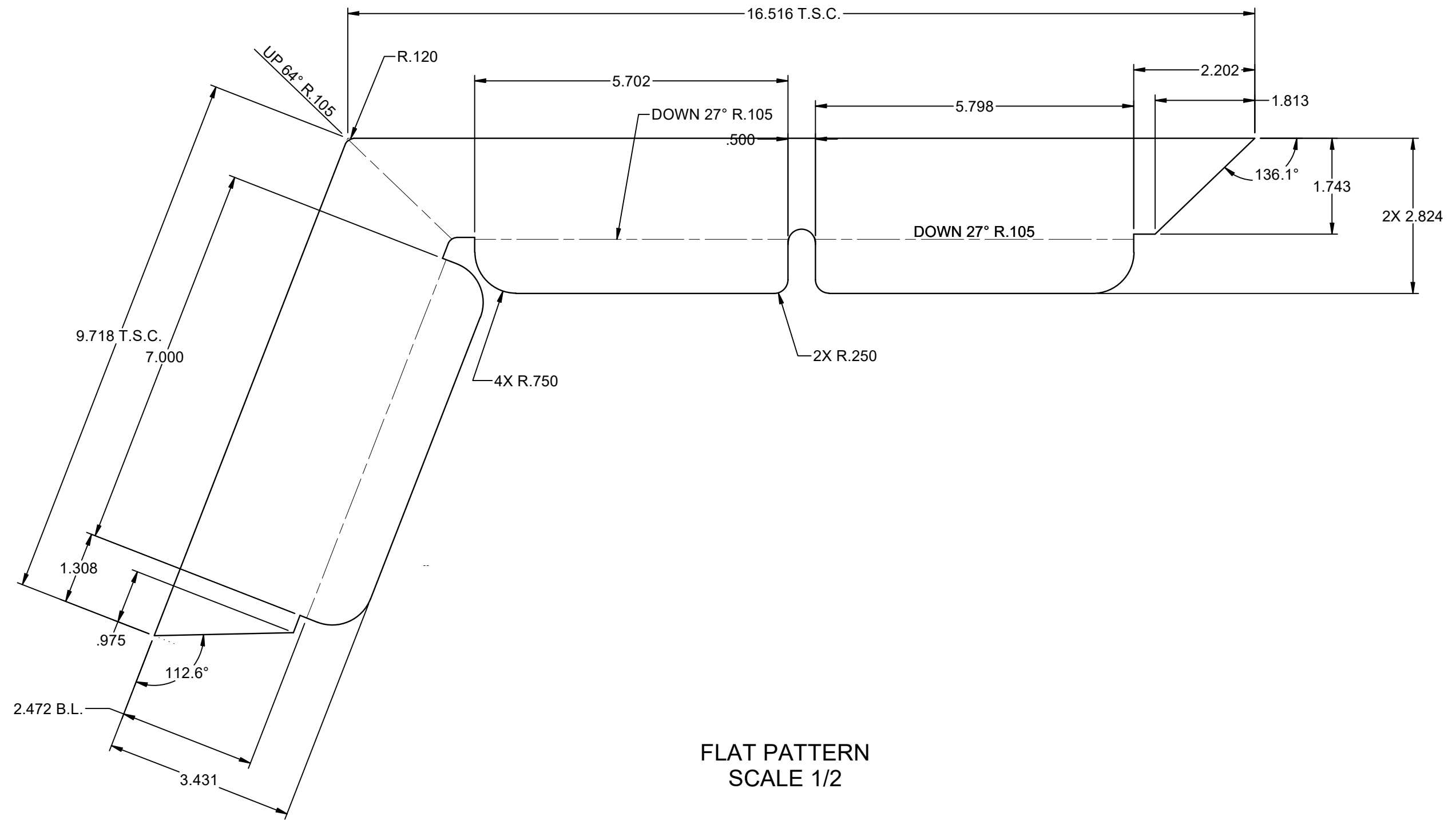


ISO VIEW
N.T.S.

NOTES (UNLESS OTHERWISE SPECIFIED):

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- TOLERANCES: FRACTIONAL (X/X) ± 1/8; TWO PLACE (0.00) ± .06; THREE PLACE (0.000) ± .015; ANGULAR ± 1°
- ALL FEATURES ARE SQUARE, SYMMETRICAL, AND TYPICAL UNLESS NOTED OTHERWISE
- REMOVE ALL BURRS AND SHARP EDGES. CLEAN UP WELD SPLATTER WHERE APPLICABLE
- FINISH: NONE
- ALL FILLET WELDS R.1/8

P0	PRELIM RELEASE		JCS	--	2/28/2024
REV	COMMENTS		BY	CHKD	DATE
<div><p>P.O. BOX 837 / 259 MURDOCK ROAD TROUTMAN, NC 28166 (704) 528-9806 (800) 438-6057 www.abtdrains.com</p></div>		FABRICATION DRAWING © 2024 ABT, Inc. XT8 - 610 CATCH BASIN TRASH BASKET OVERFLOW FRAME, 304 SS			
		FILE:	SE.TTB02-P0		PART:
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FLAT PATTERN
SCALE 1/2

AHS - Synthetic Infill Field Recommended Maintenance Program

Synthetic Turf Field Maintenance (Based on a 52 Week Use Period)

Maintenance Activity	Hours Per Year	Hours Per Maintenance Activity	Maintenance Frequency (Times Per Year)
Cleaning	96	4	24
Grooming	48	4	12
Repairs	8	4	2
Topdressing Low Areas	52	1	52
Painting	NA	NA	NA
Trench Drain Basket Cleaning	192	16	12
Trench Drain Flush	16	16	1
Inlet Basin Sump Cleaning	24	24	1
Total Man Hours	436		

Weeks of Use Per Year (60 Hours Per Week)	52		
--	----	--	--

Use Hours Per Year (60 Hours Per Week)	3120		
---	------	--	--

Maintenance Hours Per Hour of Use	0.14		
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References for AHSBC presentation

- Baensch-Baltruschat, B., Kocher, B., Stock, F., & Reifferscheid, G. (2020). Tyre and road wear particles (TRWP) - a review of generation, properties, emissions, human health risk, ecotoxicity, and fate in the environment. *Science of The Total Environment*, 733, 137823. doi:10.1016/j.scitotenv.2020.137823
- Kole, P. J., Van Belleghem, F. G. A. J., Stoorvogel, J. J., Ragas, A. M. J., & Löhr, A. J. (2023). Tyre granulate on the loose; how much escapes the turf? A systematic literature review. *Science of The Total Environment*, 903, 166221. doi:10.1016/j.scitotenv.2023.166221
- McIntyre, J. K., Spromberg, J., Cameron, J., Incardona, J. P., Davis, J. W., & Scholz, N. L. (2023). Bioretention filtration prevents acute mortality and reduces chronic toxicity for early life stage coho salmon (*Oncorhynchus kisutch*) episodically exposed to urban stormwater runoff. *Science of The Total Environment*, 902, 165759. doi:10.1016/j.scitotenv.2023.165759
- Rodgers, T. F., Wang, Y., Humes, C., Jeronimo, M., Johannessen, C., Spraakman, S., ... Scholes, R. C. (2023). Bioretention cells provide a 10-fold reduction in 6ppd-quinone mass loadings to receiving waters: Evidence from a field experiment and modeling. *Environmental Science & Technology Letters*, 10(7), 582–588. doi:10.1021/acs.estlett.3c00203
- Spromberg, J. A., Baldwin, D. H., Damm, S. E., McIntyre, J. K., Huff, M., Sloan, C. A., ... Scholz, N. L. (2015). Coho salmon spawner mortality in western us urban watersheds: Bioinfiltration prevents lethal storm water impacts. *Journal of Applied Ecology*, 53(2), 398–407. doi:10.1111/1365-2664.12534

Benson, K., Irvin-Barnwell, E., Ragin-Wilson, A., & Breysse, P. (2019). Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields: Tire Crumb Rubber Characterization and Exposure Characterization Study Overview. *Journal of environmental health*, 82(2), 28–30.

We also wanted to point to this study, which came out April 16th, 2024:

U.S. EPA & CDC/ATSDR. (2024). Synthetic Turf Field Recycled Tire Crumb Rubber Research Under the Federal Research Action Plan Final Report: Part 2 - Exposure Characterization (Volumes 1 and 2). (EPA/600/R-24/020). U.S. Environmental Protection Agency, Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry.



Town of Arlington, Massachusetts

DEP #091-0356: Notice of Intent: Thorndike Place (Continued from 4/18/2024).

Summary:

DEP #091-0356: Notice of Intent: Thorndike Place (Continued from 4/18/2024).

The Conservation Commission will hold a public hearing under the Wetlands Protection Act to consider a Notice of Intent for the construction of Thorndike Place, a multifamily development on Dorothy Road in Arlington.

ATTACHMENTS:

Type	File Name	Description
Reference Material	Thorndike_Place_-_Additional_Test_Pit_Summary_-_2024-04-24_.pdf	Thorndike Place - Additional Test Pit Summary - 2024-04-24 .pdf
Reference Material	Thorndike_Place_-_Ltr_to_ACC_4.26.24_(00288696xBC4F6).pdf	Thorndike Place - Ltr to ACC_4.26.24 (00288696xBC4F6).pdf
Reference Material	Thorndike_Place_-_BSC_Letter_2.16.21_response_to_W_S_climate_review_(00288655xBC4F6).pdf	Thorndike Place - BSC Letter 2.16.21_response to W S climate review (00288655xBC4F6).pdf

APRIL 24, 2024

Town of Arlington Conservation Commission
c/o Mr. David Morgan, Environmental Planner + Conservation Agent
Robbins Memorial Town Hall
730 Massachusetts Avenue
Arlington, Massachusetts 02476

**RE: Additional Soil Test Pits and Groundwater Monitoring
Thorndike Place Residential Development**

Dear Members of the Arlington Conservation Commission,

As discussed during the April 4, 2024, public hearing on the Thorndike Place Residential Development, the Applicant, Arlington Land Realty, LLC, has contracted with BSC Group, Inc. (BSC) to perform additional soil testing, install an additional groundwater monitoring well, and continue to monitor this new well along with the previously installed three wells on site. The new soil testing was performed and the additional well installed within the limits of the large infiltration system as shown on the attached plan. This letter summarizes the results of the test pits as well as the well monitoring.

On April 17, 2024, BSC observed and logged five (5) additional deep hole test pits (TP-9 through TP-13). An additional groundwater monitoring well was installed in the location of TP-9. Combined with the previously performed TP-2 (2020) and TP-7 and 8 (2023), a total of eight (8) test pits have been performed within the limits of or immediately adjacent to the large infiltration system location. Combined with the previously installed groundwater monitoring well at TP-7 (2023), there are now two (2) wells located within the limits of this system. Per the Commission's request, BSC coordinated with David Morgan to have a representative of the Town on site during the test pit work. The test pit work on April 17, 2024, was observed by Wolfgang Kirstein, EIT, a civil engineer with the Town of Arlington Department of Public Works Engineering Division.

The results of these additional five test pits generally match the previously performed test pits in the area of the large infiltration system. The area is predominantly fill materials with a USDA soil texture of sandy loam. This information further confirms that our use of hydrologic soil group (HSG) C soils and a lower infiltration rate than standard for sandy loam is indeed a conservative design.

While no redoximorphic features were found, groundwater was observed in each test pit during the excavation. This groundwater was observed both as standing water at the bottom of the pit and weeping along the side of the test pit. While test pit logs and photographs are attached to this letter, a summary of our findings is included in the table below.

Test Pit	Existing Grade	Total Depth (in.)	Depth Fill (in.)	Depth Standing GW (in.)	Depth Weeping GW (in)	Depth to Redox (in.)	ESHW
TP-9	11.47	118	100	116	90	n/a	3.97
TP-10	11.27	130	130	126	94	n/a	3.44
TP-11	11.09	114	114	111	93	n/a	3.34
TP-12	8.37	76	76	68	53	n/a	3.95
TP-13	7.96	74	74	67	57	n/a	3.21

As shown in the table above, the observed groundwater elevations confirm our previously determined Estimated Seasonal High Groundwater (ESHGW) elevation of 4.0.

As also discussed during the April 4, 2024, public hearing, BSC has performed additional monitoring of the previously installed wells and the new well installed on April 17. The results of this monitoring is provided in the table below.

Test Pit/Well	Groundwater Elevation		
	April 1, 2024	April 17, 2024	April 24, 2024
TP-1	2.94	3.01	2.87
TP-6	3.00	2.95	2.68
TP-7	3.41	3.47	3.30
TP-9	n/a	n/a	3.78

The above measured groundwater elevations are further evidence that the previously determined ESHGW elevation of 4.0 is appropriate for the project. BSC will be continuing with weekly monitoring of these wells and this information will be provided to the Commission as it is obtained.

Additionally, it should be noted that the month of March 2024 was one of the wettest months since 1895. The attached graphics from the National Oceanic and Atmospheric Administration (NOAA) demonstrate the severity of precipitation that occurred in March. As such, groundwater elevations during this time would be expected to be above normal conditions. This information further demonstrates that the use of 4.0 as ESHGW elevation is appropriate as no observed or measured groundwater elevations during this Spring have reached or exceeded this elevation.

BSC believes that the estimated seasonal high groundwater (ESHGW) elevation has been determined in full compliance with the Massachusetts Stormwater Handbook. With the additional test pit data and groundwater monitoring within the 2024 spring season supporting the ESHGW determined by BSC upon the results of test pits and monitoring wells first read in Spring 2023, we believe the ESHGW of 4.0 is the correct and appropriate value for use in the project's stormwater management design.

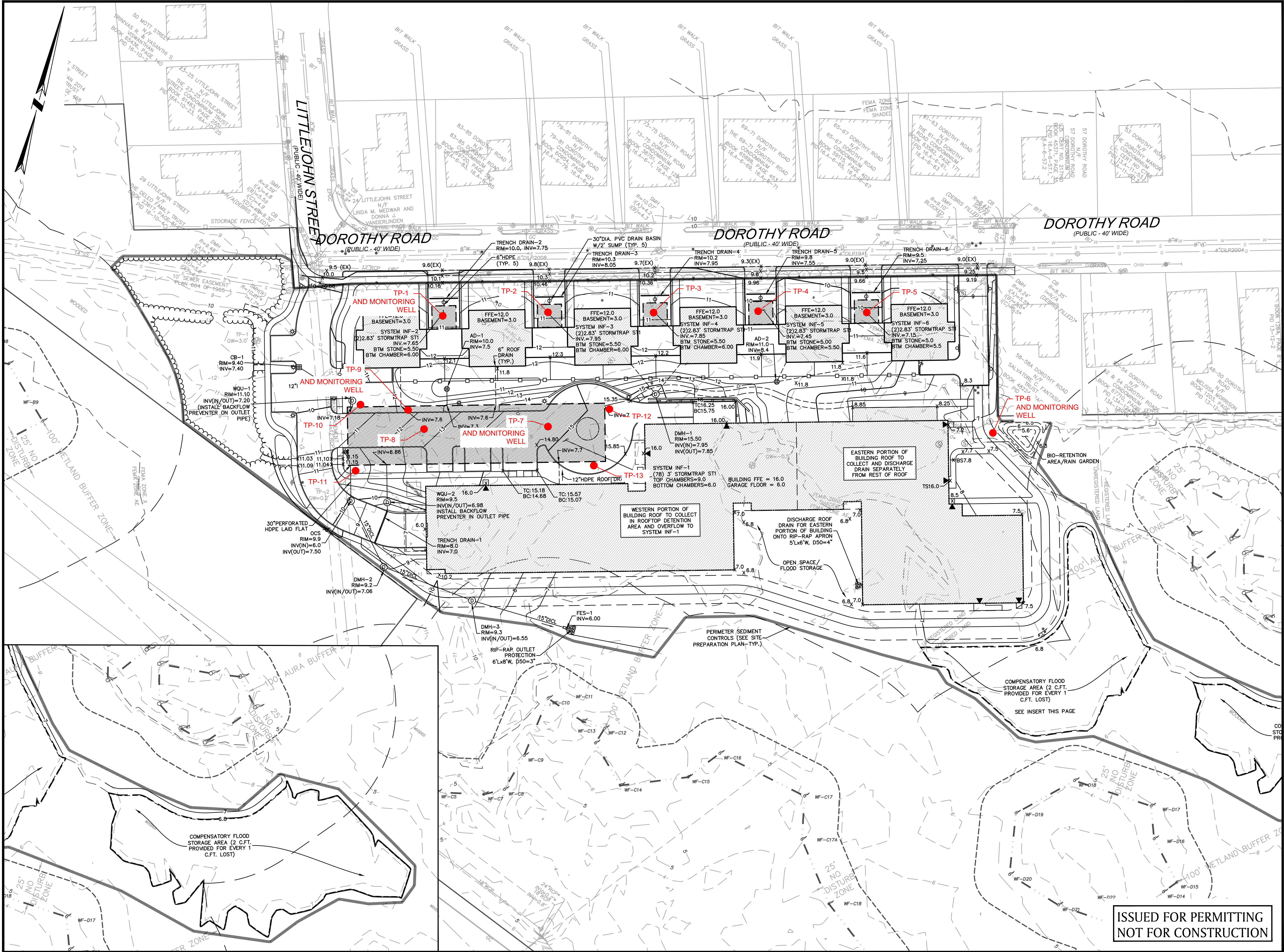
We look forward to further discussing the project with you at the upcoming public hearing. Please feel free to contact me at (617) 896-4386 or drinaldi@bscgroup.com should you have any questions on the information in this report.

Sincerely,
BSC GROUP, INC.



Dominic Rinaldi, PE
Senior Associate

Attachments: Test Pit Location Plan
April 17, 2024 Test Pit Logs
April 17, 2024 Test Pit Photos
NOAA Precipitation Information March 2024



THORNDIKE PLACE

DOROTHY ROAD
IN
ARLINGTON
MASSACHUSETTS
(MIDDLESEX COUNTY)

TEST PIT MAP
MAY 2023

REVISIONS:		
NO.	DATE	DESC.

PREPARED FOR:
ARLINGTON LAND REALTY, LLC
84 SHERMAN STREET, 2ND FLOOR
CAMBRIDGE, MA 02140

**BSC GROUP**

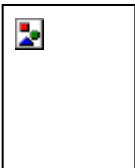
803 Summer Street
Boston, Massachusetts
02127

617 896 4300

© 2021 BSC Group, Inc.
SCALE: 1" = 30'
0 15 30 60 FEET

FILE: \\Civil\Drawings\2340700-GR
DWG: SHEET C-104
JOB. NO: 23407.00

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Arlington Land Realty, LLC.

Owner Name

Dorothy Road

Street Address

Arlington

City

MA

State

16-8-2, 16-8-3, 16-8-4, 16-8-5, 16-8-6, 16-8-7A

Map/Lot #

02474

Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey NRCS USDA Web Soil Survey

Source

655

Soil Map Unit

Udorthents, wet substratum

Soil Series

Depressions

Landform

Soil Limitations

Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Soil Parent material

3. Surficial Geological Report

2018/USGS

Year Published/Source

Artificial fill, glaciomarine fine deposits, stagnant ice deposits

Map Unit

Fine/very fine sand down to very fine sand, silt, silty clay, and clay

Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No

If yes, MassGIS Wetland Data Layer:

Wetland Type

7. Current Water Resource Conditions (USGS):

April 17, 2024

Month/Day/ Year

Range: ☐ Above Normal

☒ Normal

☐ Below Normal

8. Other references reviewed:

Not in Zone II or IWPA (MassMapper)

(Zone II, IWPA, Zone A, EEA Data Portal, etc.)



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-9 4/17/24 8:30AM Clear, 50 42.4' N 71.2' W
Hole # Date Time Weather Latitude Longitude

1. Land Use Wooded lot in residential area Trees Some surface stones, not many 7%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Center of proposed infiltration system (large); between TP-7 and TP-8; about 110 feet from Dorothy Road

2. Soil Parent Material: Glaciofluvial deposits Depression FS
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands 205 feet
Property Line 110 feet Drinking Water Well >100 feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 90" Depth to Weeping in Hole 116" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-100	Fill	Sandy Loam	7.5YR 4/7		Cnc : Dpl:		0	4-6	Massive	Friable	
100-118	C	Fine Sandy Loam	10YR 4/1		Cnc : Dpl:		0	0	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes: Installed monitoring well; groundwater weeping from side of pit and standing water at bottom of pit



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-10 4/17/24 10:00 AM Clear, 50 42.4' N 71.2' W
Hole # Date Time Weather Latitude Longitude

1. Land Use Wooded lot in residential area Trees Some surface stones, not many 3%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Northwest corner of infiltration system; about 100' from Dorothy Road

2. Soil Parent Material: Glaciofluvial deposits Depression BS
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands 250 feet
Property Line 79 feet Drinking Water Well >100 feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 94" Depth to Weeping in Hole 126" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-130	Fill	Sandy Loam	7.5YR 4/2		Cnc : Dpl:		0	4-6	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:

Groundwater weeping from side of hole and standing water at bottom of pit; debris and construction material present throughout fill



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

☐ Depth to soil redoximorphic features

Obs. Hole # TP-9

_____ inches

Obs. Hole # TP-10

_____ inches

☒ Depth to observed standing water in observation hole

90 inches

94 inches

☐ Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

_____ inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☐ Yes ☒ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)?

Upper boundary: _____

inches

Lower boundary: _____

inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____

90
inches

Lower boundary: _____

118
inches



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-11 4/17/24 10:45AM Clear, 55 42.4' N 71.2' W
Hole # Date Time Weather Latitude Longitude

1. Land Use Wooded lot in residential area Trees Some surface stones, not many 6%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Southwest corner of infiltration system; about 135' from Dorothy Road

2. Soil Parent Material: Glaciofluvial deposits Depression FS
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands 215 feet
Property Line 46 feet Drinking Water Well >100 feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 93" Depth to Weeping in Hole 111" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-114	Fill	Sandy Loam	7.5YR 4/2		Cnc : Dpl:		0	4-6	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-12 4/17/24 11:30AM Clear, 55 42.4' N 71.2' W
Hole # Date Time Weather Latitude Longitude

1. Land Use Wooded lot in residential area Trees Some surface stones, not many 3%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Northeast corner of infiltration system; about 95' from Dorothy Road

2. Soil Parent Material: Glaciofluvial deposits Depression FS
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands 215 feet
Property Line 92 feet Drinking Water Well >100 feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 53" Depth to Weeping in Hole 68" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-76	Fill	Sandy Loam	7.5YR 3/2		Cnc : Dpl:		0	50	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes: Larger cobbles/boulders throughout test pit



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

☐ Depth to soil redoximorphic features

☒ Depth to observed standing water in observation hole

☐ Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

Obs. Hole # TP-11

_____ inches

93 inches

_____ inches

Obs. Hole # TP-12

_____ inches

53 inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☐ Yes ☒ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)?

Upper boundary: _____

_____ inches

Lower boundary: _____

_____ inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____

53
_____ inches

Lower boundary: _____

76
_____ inches



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-13 4/17/24 11:45AM Clear, 55 42.4' N 71.2' W
Hole # Date Time Weather Latitude Longitude

1. Land Use Wooded lot in residential area Trees Some surface stones, not many 1%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)

Description of Location: Southeast corner of infiltration system; about 135' from Dorothy Road

2. Soil Parent Material: Glaciofluvial deposits Depression TS
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100 feet Drainage Way >100 feet Wetlands 180 feet
Property Line 130 feet Drinking Water Well >100 feet Other _____ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 57" Depth to Weeping in Hole 67" Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-74	Fill	Sandy Loam	7.5YR 3/2		Cnc : Dpl:	5-10	0	10-20	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

☐ Depth to soil redoximorphic features

Obs. Hole # TP-13

Obs. Hole # _____

_____ inches

_____ inches

☒ Depth to observed standing water in observation hole

57 inches

_____ inches

☐ Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

_____ inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☐ Yes ☒ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)?

Upper boundary: _____

Lower boundary: _____

inches

inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____

Lower boundary: _____

57

74

inches

inches



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of mv soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

Emily Derrig, SE 14158

Typed or Printed Name of Soil Evaluator / License #

4/17/2024

Date

6/30/2026

Expiration Date of License

Name of Approving Authority Witness

Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

Field Diagrams: Use this area for field diagrams:



TP-9 at full depth



TP-9 at full depth



TP-9 with monitoring well



TP-10 at full depth



TP-10 at full depth



TP-11 at full depth



TP-11 at full depth



TP-12 at full depth



TP-12 at full depth



TP-13 at full depth



TP-13 at full depth

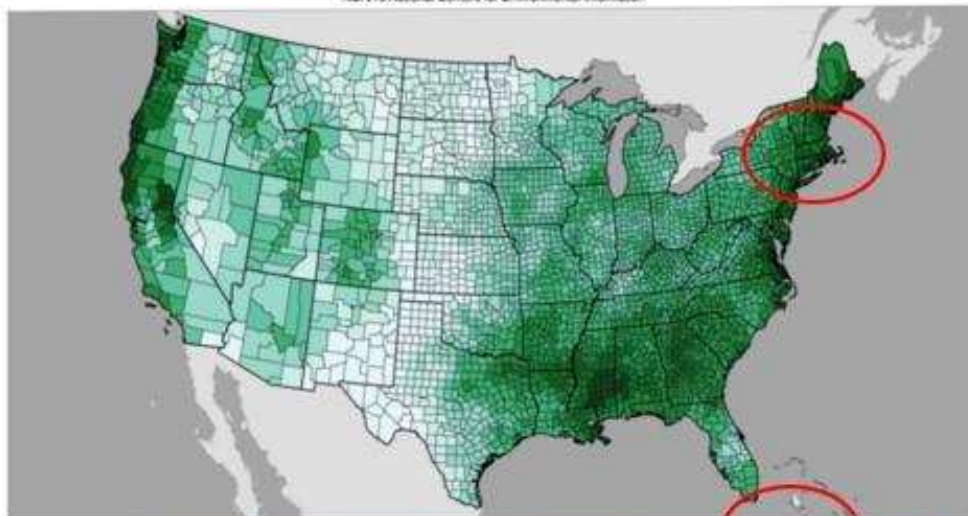


Total Precipitation

March 01–31, 2024



NOAA's National Centers for Environmental Information



Created: Fri Apr 05 2024
Source: nClimGrid-Daily



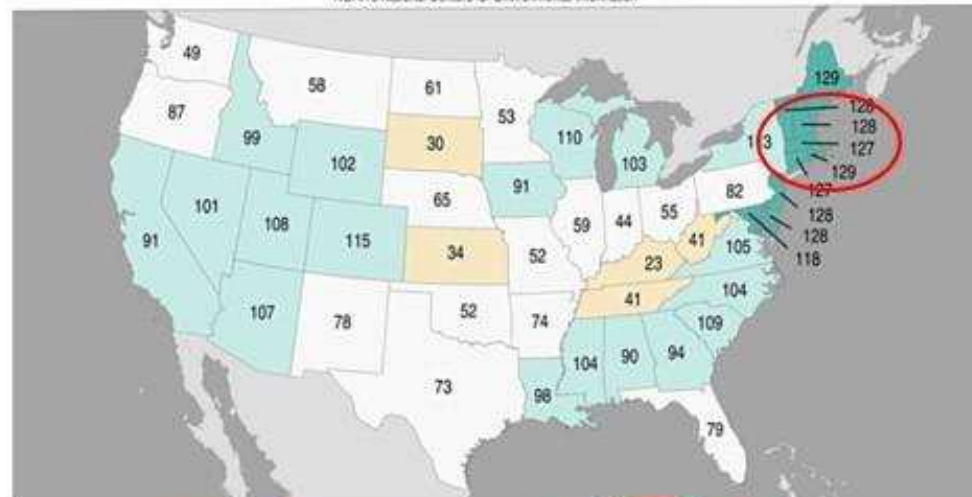
Statewide Precipitation Ranks

March 2024



Ranking Period: 1895–2024

NOAA's National Centers for Environmental Information



Created: Thu Apr 4 2024
Source: nClimGrid - Monthly



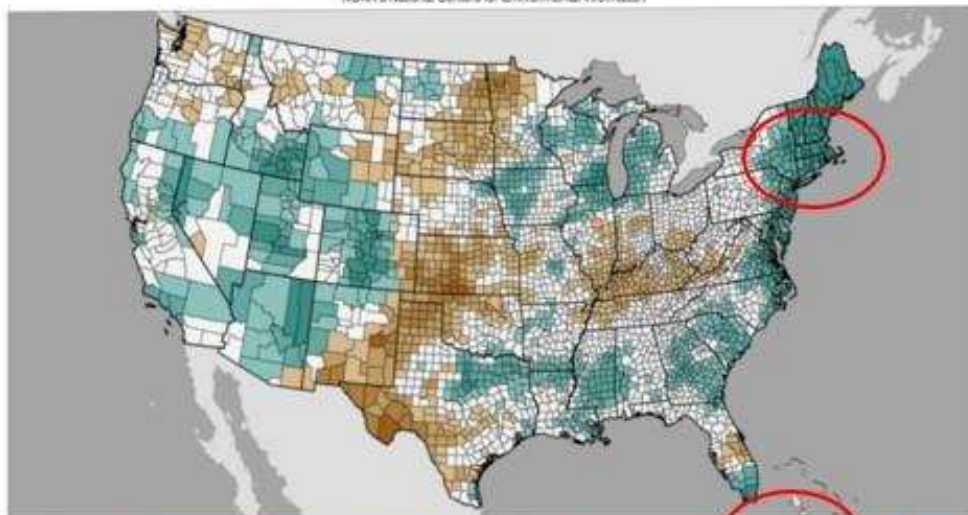
Precipitation Percent of Average

March 01–31, 2024

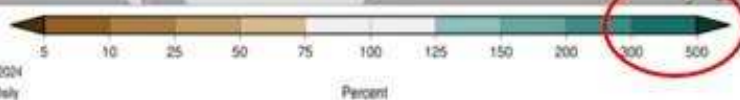


Average Period: 1991–2020

NOAA's National Centers for Environmental Information



Created: Fri Apr 05 2024
Source: nClimGrid-Daily



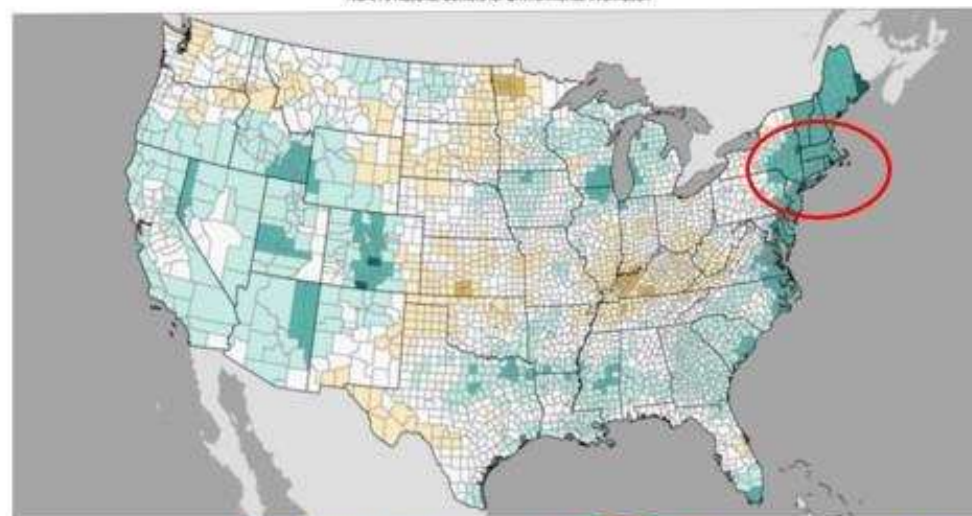
County Precipitation Ranks

March 2024



Ranking Period: 1895–2024

NOAA's National Centers for Environmental Information



Created: Thu Apr 04 2024
Source: nClimGrid-Monthly



April 26, 2024

Via Email

Chuck Tirone, Co-Chairperson
Susan Chapnick, Co-Chairperson
Arlington Conservation Commission
Robbins Memorial Town Hall
730 Massachusetts Avenue
Arlington, MA 02476

Attn: David Morgan

RE: Thorndike Place, Arlington, MA

Dear Mr. Tirone and Ms. Chapnick and Members of the Commission,

By email communication yesterday, Thursday, April 25, Mr. Morgan provided a copy of a recent submission to the Commission by Clarissa Rowe, inclusive of a draft Weston & Sampson review memo (dated January 19, 2021) and a final review memo prepared by Weston & Sampson (dated January 20, 2021), that previously had been submitted via transmittal letter by the Arlington Land Trust to the Arlington Zoning Board (“ZBA”), within the course of the ZBA’s review of the Thorndike Place Comprehensive Permit Application.

To ensure a complete record for the Commission, attached hereto please find the February 16, 2021, BSC Group response letter which had been provided within the ZBA hearing, fully addressing, and clarifying the statements within the Weston & Sampson memo. Further, it is to be noted that the January 20, 2021, Weston & Sampson memo did not review the final approved project design, but rather the design of a larger, 176-unit single residential building on the Mugar property¹.

As summarized on page 4 of the enclosed BSC correspondence: “[T]he Applicant has reviewed and considered increased flooding from sea level rise, storm surge, and precipitation projections in the design of the project. As stated, Site has previously been used as an area for flood storage and will continue to do so as the area proposed for development is located outside of the floodplain with the exception of a minimal impact that is being mitigated at a 2 to 1 ratio. The design of Thorndike Place considers the best available climate data for this location (City of Cambridge data), and the impacts of the proposed development under future climate scenarios has been assessed.” While the

¹ The Comprehensive Permit for Thorndike Place, as approved unanimously by the ZBA, consists of a total of 136 residential units, consisting of a 124-unit independent living structure and 6 duplex townhouse-style structures along Dorothy Road.

project design was modified since February 2021, the same statements on design remain true as to the approved 40B Thorndike Place project design, which is now subject to review under the State Wetlands Protection Act (“WPA”).

We trust that the enclosed BSC Group correspondence that had previously responded to the Weston and Sampson memo within the comprehensive permit hearings will be helpful to provide a balanced review of the recent submission by Ms. Rowe of the Weston & Sampson January 2021 memo.

Sincerely,

/s/ Stephanie A. Kiefer

Stephanie A. Kiefer

Encl.

cc: Dom Rinaldi
John Hession

Sent Via Email

February 16, 2021

Christian Klein, Chair
Zoning Board of Appeals
Town of Arlington
Arlington, MA 02476

RE: Arlington Land Trust – Weston & Sampson Resiliency Review

Dear Chairman Klein:

BSC Group is in receipt of the resiliency review related to the East Arlington Mugar site (Thorndike Place) conducted by Weston & Sampson, dated January 20, 2021, on behalf of the Arlington Land Trust. BSC has reviewed the Weston & Sampson memorandum and offers the following responses and clarifications related to the information presented. The memorandum section headings are included for ease of review.

Background

History

- Weston & Sampson states that the Site is located within a protected wetland in both a FEMA established 100-year floodplain and 500- year floodplain. This statement is only partially accurate. Much of the 17.5-acre site contains regulated wetlands and 100-year floodplain. However, the portion of the Site proposed for development is located entirely outside of wetlands and includes only minimal impacts to 100-year floodplain.
- Weston & Sampson also states that the Applicant is utilizing the Chapter 40B statute to seek to bypass the protected wetlands zoning regulations by providing a certain percentage of affordable housing in the Thorndike Place development. This statement is not accurate. Under Chapter 40B, the Applicant is required to meet the requirements of the Wetlands Protection Act, as a minimum, but as part of the Thorndike Place proposal, the Applicant proposes to meet not only the requirements of the Wetlands Protection Act but also the setback and compensatory storage requirements of the Town of Arlington Wetland Protection Regulations (2015). Again, no structure is proposed within the wetlands.
- Figures 1 through 7 of the Weston & Sampson memorandum depict scenes after previous storm events. It is important to note that the figures primarily depict locations east of the Minuteman Bikeway, adjacent to Alewife Brook, located within the FEMA Floodway and at elevations approximately 3 – 5 feet lower than the area of the Site proposed for development. These Figures are not representative of the area of the Site proposed for development.

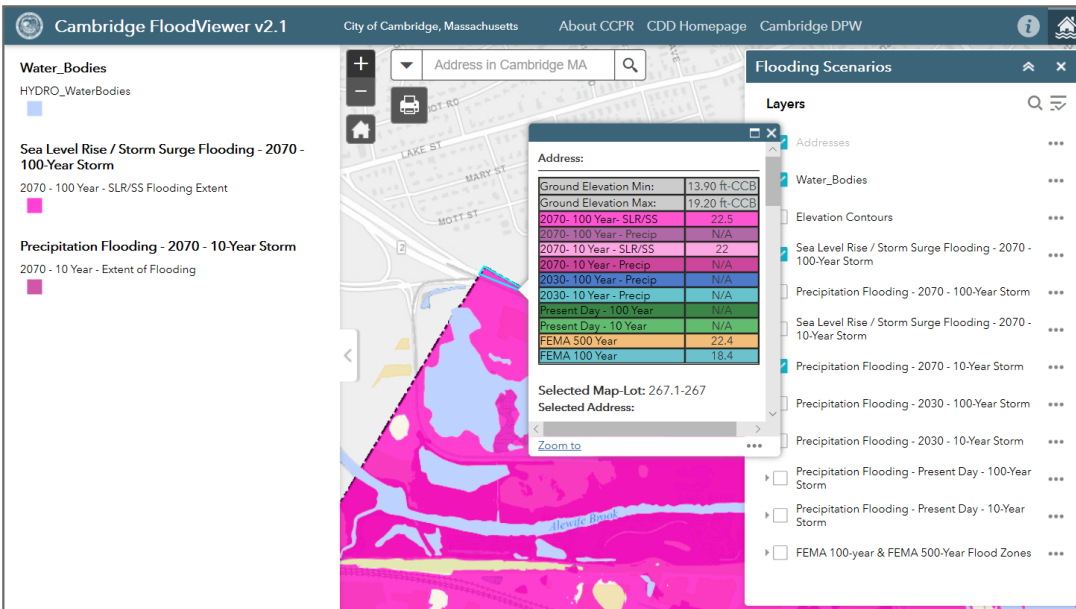


Current Design

- Weston & Sampson states that “the current design of the Thorndike Place development meets regulatory requirements, with a 2 to 1 compensatory flood storage ratio, as well as a design flood elevation (DFE) in accordance with FEMA’s 100-year base flood elevation (BFE).” Again, it is important to note that as Weston & Sampson states, the design meets both the Wetlands Protection Act and Town of Arlington Wetlands Protection Regulations.

FEMA Regulations vs. Neighboring Communities

- Weston & Sampson states that current Massachusetts legislation requires that buildings be designed to the 100-year base flood elevation (BFE), which is the elevation that Thorndike Place design relies on at 6.8 feet NAVD88. BSC concurs that this is an accurate statement of the law. Additionally, Weston & Sampson states that FEMA defines the 500-year flood elevation at 10.75 feet NAVD88 and that the first floor living space for the Thorndike Place development is designed at an elevation of approximately 13 feet NAVD88, making it suitable for projected sea level rise (SLR) and storm surge (SS) effects. Again, BSC concurs with these statements.
- BSC has reviewed the Cambridge Climate Change Vulnerability Assessment and the Cambridge FloodViewer to understand the anticipated 2070 SLR/SS and precipitation flooding at the Site. FEMA shows that the flood elevation upstream of Route 2 (Cambridge) and downstream of Route 2 (Site) is the same. Using this, it is anticipated that the 2070 flooding at the Site will be the same as shown on the Cambridge FloodViewer directly across Route 2. The Cambridge FloodViewer shows the anticipated 2070 100-year SLR/SS flood elevation 22.5 Cambridge City Datum (see below). The Cambridge City Datum is 11.65 feet above NAVD88. The equivalent 2070 100-year flood elevation on the Site is 10.85 feet NAVD88 or an increase of approximately 4 feet above the current FEMA 100-year flood elevation, which is and approximately 2 feet below the proposed elevation of the first floor living space at elevation 13 NAVD88.



Design Storm Depths

- Under Chapter 40B, the project is required to meet the precipitation frequency statistics based on Technical Paper 40 (TP40) as referenced in the Wetland Protection Act and the Massachusetts Stormwater Handbook. The Town of Arlington Wetlands Protection Regulations require the use of the more conservative Cornell precipitation frequency statistics. While not required to apply the Cornell statistics, the project stormwater management design has utilized the Cornell precipitation frequency statistics as required by the Town of Arlington Wetlands Protection Regulations. To further clarify, the National Oceanic Atmospheric Administration (NOAA) Atlas 14 Plus Method for determining design standards for precipitation have not been adopted by MassDEP or the Arlington Conservation Commission and should not be a requirement of this project.

Additional Resilient Design Issues

Deployable Flood Barriers

- The design of flood protection/flood barriers for the Garage Level of the project will be incorporated into the building plans to be submitted for building permit. Flood protection design will incorporate operational considerations including installation needs (time range for deployment, manpower, installation cost, etc.), repair during storm event, retraction needs, storage, and re-use of the products in the selection of the appropriate flood barriers. In other words, the project will not be retrofitted, but the resilient design issues will be incorporated into the building's construction.

Base Flood Elevation

- The proposed building will not be located within a flood FEMA hazard area. Additionally, the first floor of livable units have been designed to be more than 1 foot above the FEMA 100-year floodplain of elevation 6.8 NAVD88 and the 2070 100-year SLR/SS flood elevation of 10.85 NAVD88.



Compensatory Flood Storage Ratio

- The provision of a compensatory flood storage at a ratio of 2 to 1 will NOT minimize the area of Bordering Land Subject to Flooding, impacting flood recovery. Compensatory storage at the Town of Arlington Wetland Protection Regulations ratio of 2 to 1 will actually increase the area of Bordering Land Subject to Flooding on the Site upon completion of grading and construction.

Urban Heat Island Effect

- There were no urban heat island regulations in effect at the time of Thorndike Place Comprehensive Permit application. The current site design greatly reduces potential heat island effects by significantly reducing the area of the Site to be cleared for development and reducing the building and pavement impervious surfaces. The building will include white roofs and rooftop stormwater detention. Additionally, the project will provide a floodplain restoration plan for the area of compensatory flood storage and will conform to vegetation removal and replacement requirements identified in Section 24 of the Wetland Protection Regulations

Summary

As noted above, the Applicant has reviewed and considered increased flooding from sea level rise, storm surge, and precipitation projections in the design of the project. As stated, Site has previously been used as an area for flood storage, and will continue to do so as the area proposed for development is located outside of the floodplain with the exception of a minimal impact that is being mitigated at a 2 to 1 ratio. The design of Thorndike Place considers the best available climate data for this location (City of Cambridge data), and the impacts of the proposed development under future climate scenarios has been assessed. BSC Group provides the following responses to the Weston & Sampson recommendations regarding the design of Thorndike Place:

1. BSC has reviewed the Cambridge Climate Change Vulnerability Assessment and the Cambridge FloodViewer to identify anticipated 2070 100-year SLR/SS flood elevations for the Site and has presented the findings from that review above.
2. Under Chapter 40B, the project is required to meet the precipitation frequency statistics based on Technical Paper 40 (TP40) as referenced in the Wetland Protection Act and the Massachusetts Stormwater Handbook. The Town of Arlington Wetlands Protection Regulations require the use of the more conservative Cornell precipitation frequency statistics. The project stormwater management design has utilized the Cornell precipitation frequency statistics as required by the Town of Arlington Wetlands Protection Regulations.
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Sincerely,

BSC Group, Inc.

John Hession, P.E.
Vice President

cc: zba@town.arlington.ma.us
Jennifer Raitt, Director, Department of Planning and Community Development
Paul Haverty, Blatman, Bobrowski & Haverty, LLC
Stephanie Kiefer, Smolak & Vaughan
Gwen Noyes and Arthur Klipfel, Arlington Land Realty

Sent Via Email

February 16, 2021

Christian Klein, Chair
Zoning Board of Appeals
Town of Arlington
Arlington, MA 02476

RE: Arlington Land Trust – Weston & Sampson Resiliency Review

Dear Chairman Klein:

BSC Group is in receipt of the resiliency review related to the East Arlington Mugar site (Thorndike Place) conducted by Weston & Sampson, dated January 20, 2021, on behalf of the Arlington Land Trust. BSC has reviewed the Weston & Sampson memorandum and offers the following responses and clarifications related to the information presented. The memorandum section headings are included for ease of review.

Background

History

- Weston & Sampson states that the Site is located within a protected wetland in both a FEMA established 100-year floodplain and 500- year floodplain. This statement is only partially accurate. Much of the 17.5-acre site contains regulated wetlands and 100-year floodplain. However, the portion of the Site proposed for development is located entirely outside of wetlands and includes only minimal impacts to 100-year floodplain.
- Weston & Sampson also states that the Applicant is utilizing the Chapter 40B statute to seek to bypass the protected wetlands zoning regulations by providing a certain percentage of affordable housing in the Thorndike Place development. This statement is not accurate. Under Chapter 40B, the Applicant is required to meet the requirements of the Wetlands Protection Act, as a minimum, but as part of the Thorndike Place proposal, the Applicant proposes to meet not only the requirements of the Wetlands Protection Act but also the setback and compensatory storage requirements of the Town of Arlington Wetland Protection Regulations (2015). Again, no structure is proposed within the wetlands.
- Figures 1 through 7 of the Weston & Sampson memorandum depict scenes after previous storm events. It is important to note that the figures primarily depict locations east of the Minuteman Bikeway, adjacent to Alewife Brook, located within the FEMA Floodway and at elevations approximately 3 – 5 feet lower than the area of the Site proposed for development. These Figures are not representative of the area of the Site proposed for development.

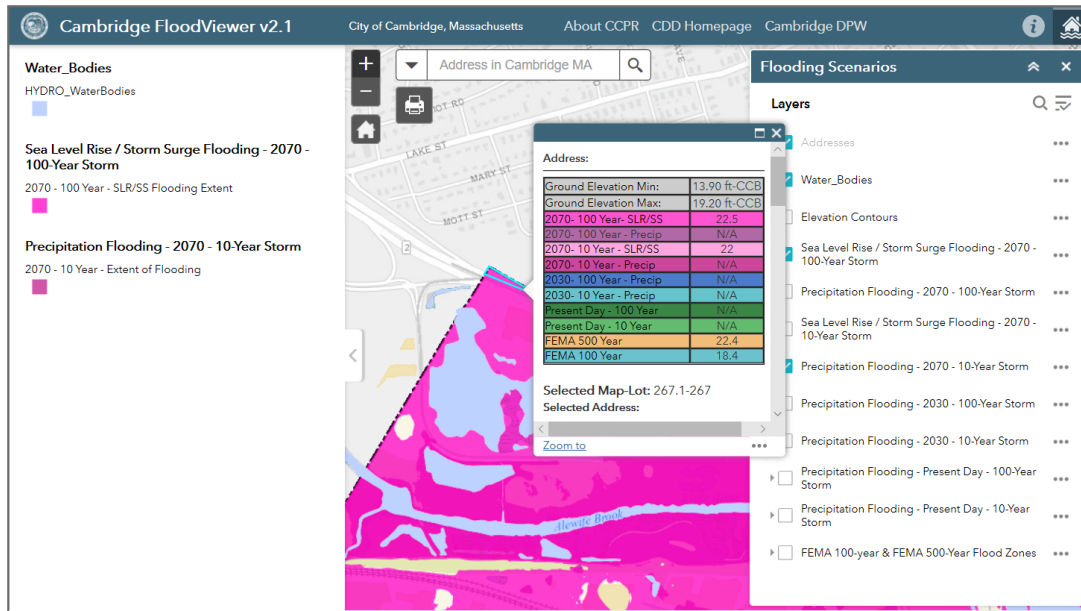


Current Design

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Sincerely,

BSC Group, Inc.

John Hession, P.E.
Vice President

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